Series 1958, No. 17

Issued March 1962

SOIL SURVEY

Scott County Indiana

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service

In cooperation with

PURDUE UNIVERSITY AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Scott County will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodlands; and add to the fund of knowledge in soil science.

In making this survey, soil scientists walked over the fields and woodlands. They dug holes and examined surface soils and subsoils; measured slopes with a hand level; noticed differences in growth of crops, weeds, and brush; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming, engineering, forestry, and related uses.

The scientists plotted the boundaries of the soils on aerial photographs. Then, cartographers prepared from the photographs the detailed soil map in the back of this report. Fields, woods, roads, and many other landmarks can be seen on the map.

Locating the Soils

Use the index to map sheets to locate areas on the large map. The index is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map has been found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they appear on the map. The symbol is inside the area if there is enough room; otherwise, it is outside the area and a pointer shows where the symbol belongs.

Finding Information

This soil report has special sections for different groups of readers, as well as some sections of value to all. The section "Additional Facts About the County" will be of interest mainly to those not familiar with the county.

Farmers and those who work with farmers will be interested in the section "Descriptions of Soils" and in the section "Use and Management of Soils." Study of these sections will aid them in identifying soils on a farm, in learning ways the soils can be managed, and in judging what yields can be expected. The Guide for Mapping Units at the back of the report will simplify use of the map and the report. This guide gives the map symbol for each soil, the name of the soil, the page on which the soil is described, the capability unit in which the soil has been placed, and the page where the capability unit is described.

Foresters and others interested in management of woodlands can refer to the "Forestry" section. Tables in that section give estimated yields of hardwoods and list the trees suitable for planting.

Engineers will want to refer to the section "Soil Properties Important in Engineering." A table in that section shows characteristics of the soils that affect engineering.

Soil Scientists will find information about how the soils were formed and how they were classified in the section "Formation, Classification, and Morphology of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

* * * * *

The survey was made cooperatively by the United States Department of Agriculture and the Purdue University Agricultural Experiment Station. It is part of the technical assistance furnished to the Scott County Soil Conservation District, which was organized in 1945. The fieldwork on this soil survey was completed in 1958.

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SOIL SURVEY OF SCOTT COUNTY, INDIANA

BY DALLAS D. MONTGOMERY, ARMIN R. GRUNEWALD, RONALD D. FROEDGE, AND EARL E. VOSS, SOIL SCIENTISTS, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE PURDUE UNIVERSITY AGRICULTURAL EXPERIMENT STATION

SCOTT COUNTY, in the southeastern part of Indiana (fig. 1), has a total area of 123,520 acres, or 193 square miles. Scottsburg, the county seat, is near the center of the county. The climate provides ample precipitation and favorable temperature for farming. The physiography ranges from broad bottom lands near the East Fork Muscatatuck River in the northwestern part of the county to high uplands in the southwest. The county is drained by many streams. Agriculture is the main source of income in the county. Corn and wheat are the main crops; and livestock is raised for meat and dairy products. Many people work in factories and canneries.

How a Soil Survey Is Made

When a soil survey is made in the field, the soils are examined, classified, and mapped. The mapping is done by a soil scientist who walks over the land and studies the soils. He bores or digs holes and looks at exposed gullies, cuts, and banks to examine the soils and the underlying rock formations. These borings and exposures show that most soils contain several distinct layers, or horizons, which together make up the soil profile. Each horizon is studied and its characteristics are noted. The main horizons are designated by letters, for example, A, B, and C. Subdivisions of these main horizons are indicated by subscript letters and numbers such as A_p, A_1, A_2, B_1, B_2, B_3. These subdivisions are made if a worthwhile difference occurs in color, texture, structure, or consistence of the soil. By considering these characteristics, farmers, engineers, foresters, and others who work with soils can judge the behavior of the soils and can tell how to use the soils more effectively.

The *color* of each horizon is noted. These colors are determined by comparing the colors of the soil with the standard colors on the Munsell color chart. The colors are designated by numbers and letters. For example, grayish brown is 10YR 5/2, and light olive brown, 2.5Y 5/4. The color of the surface soil is normally related to the amount of organic matter. Streaks and spots of gray, yellow, red, and brown in the subsurface and subsoil layers indicate poor natural drainage and restricted aeration. This coloration is called mottling. Uniform brown, yellow, and red colors indicate well-drained soils.

Texture, or the proportionate content of sand, silt, and clay, is determined by the way the soil feels when rubbed between the fingers. Later, the soil is checked in the laboratory by mechanical analyses. Texture has much to do with how well the soil retains moisture, plant nutrients, and fertilizer and whether it is easy or difficult to cultivate.

Structure, which is the way individual soil particles are arranged in larger grains and the amount of pore space between particles, indicates how easily plant roots can penetrate the soil. Structure also affects the rate water enters and filters through the soil.

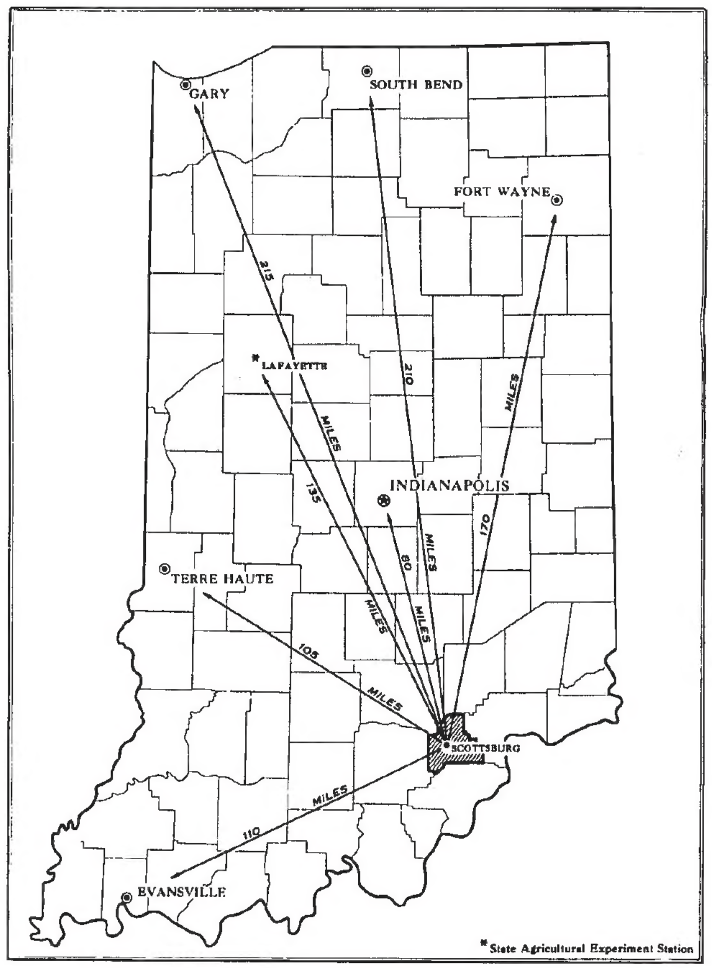

***Figure 1.*—Location of Scott County in Indiana.**

Consistence, or the tendency of soil particles to hold together, indicates whether it is easy or difficult to keep the soil open and porous under cultivation.

The soil scientist also determines the thickness of the soil profile and the depth to bedrock or to compact layers and parent materials. The kind of bedrock or parent material from which the soils develop affects the quantity and kind of plant nutrients in the soils. The amount of stone, rock, sand, and other material is observed, as well as the steepness and length of slopes and the amount of soil lost through erosion. After this examination, the physical characteristics are recorded and the boundaries of the soils are drawn on an aerial photograph. Later the finished maps that are in the soil survey report are made by cartographers. Symbols are used to represent the soil name, slope, erosion, and other special features. Laboratory tests determine the content of plant nutrients, moisture-holding capacity, chemical reaction, lime requirements, and other internal characteristics of the soils.

On the basis of the characteristics observed by the soil scientists or determined by laboratory tests, the soils are classified into series, types, and phases. A soil series consists of soils that, except for the texture of the surface soil, are similar in kind, thickness, and arrangement of layers, or horizons. All soils in the same series have formed from the same kind of parent material. Each series is named for a place near the location where the soil was first mapped.

Each series has one or more types. Soils that are similar in kind, thickness, and arrangement of soil layers, but that differ in the texture of the surface layer, make up one soil type. Soil types may be subdivided into phases on the basis of slope, amount of erosion, or some other characteristic.

The soil phase, or the soil type if it has not been subdivided, is the mapping unit on the soil map. It is the unit that has the narrowest range of characteristics. More specific use and management can be prescribed for the soil phase or soil type than for the soil series or other broader classification.

General Soil Map

In mapping a county or other large tract, it is fairly easy to see definite changes as one travels from place to place. There are many obvious changes in the shape, gradient, and length of slopes; in the course, depth, and speed of streams; in the width of valleys; in the kinds of native plants; and in the kinds of agriculture. With these more obvious changes, there are other less easily noticed changes in the patterns of soils. The soils differ from place to place along with the other parts of the environment.

By drawing lines around different patterns of soils on a small map, one may obtain a map of the general soil areas or, as they are sometimes called, soil associations. Such a map is useful to those who want only a general idea of the soils, who want to compare different parts of the county, or who want to locate areas suitable for some particular kind of agriculture or other land use. Because it is too small and shows patterns rather than single soils, the map cannot be used in planning management for any one farm.

The five general soil areas, or soil patterns, in Scott County are shown on the colored map at the back of this report. For each area, the soil series of the principal soils in the area are named, but the soils of other series may also occur in the area. Some of the main soils in these general soil areas are shown in relationship to the underlying rock in the section "Formation, Classification, and Morphology of Soils."

General Soil Area 1

The Haymond, Wilbur, and Wakeland soils are the principal soils in this area. These soils are on bottom lands along streams. The Haymond and Wilbur soils are in higher positions than the Wakeland soils and are flooded less frequently than those soils. The Wakeland soils need artificial drainage.

This soil area occupies 5 percent of the county. Figure 2 shows a strip of bottom land in this soil area.

The soils in this area are dark brown to dark yellowish brown and are medium acid to neutral. They are the most fertile soils in the county. They are deep and imperfectly drained to well drained, except in small areas adjacent to streams in the southwestern part of the county. In these small areas, the soil material is less than 25 inches deep over coarse sand and gravel.

The principal crops grown in this area are field corn, sweet corn, soybeans, and cabbage. Most of the shallow areas are in timber and pasture. The soils in this area do not need lime, but yields will be increased if fertilizer is added and crop residue is plowed under.

General Soil Area 2

This soil area consists of soils on bottom lands and soils on terraces (fig. 3). On the bottom lands are the Pope, Philo, Stendal, and Atkins soils; on the terraces are the Haubstadt, Otwell, Dubois, and Robinson soils. These soils are deep and poorly drained to well drained. They are acid and low in fertility. At depths of 4 to 6 feet, they are underlain by stratified material. This soil area makes up 22 percent of the county.

The soils on bottom lands make up 96 percent of this soil area. The Atkins soils, which are on bottom lands,

Figure 2.—**General soil area 1. Narrow strip of bottom land in the foreground and uplands in the background.**

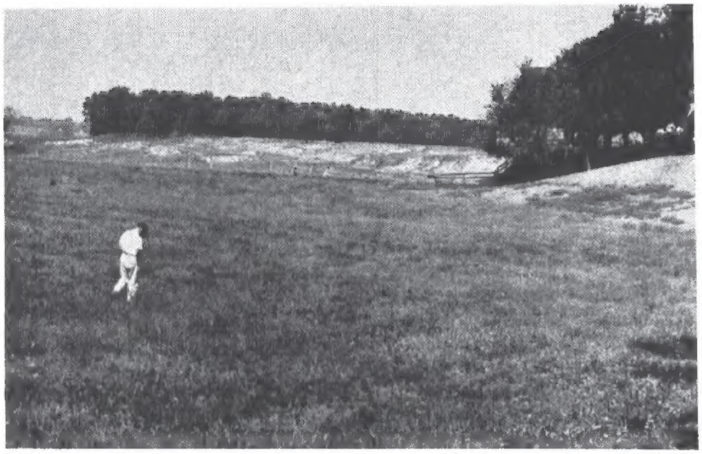

Figure 3.—General soil area 2. Bottom land in the foreground and high terraces in the background.

Figure 4.—General soil area 3. Pasture on Jennings soil in the foreground, and living fence in the background. This is a wildlife area.

have a gray to grayish-brown surface layer and a mottled gray silt loam to silty clay loam subsoil. The Pope, Philo, and Stendal soils, also on bottom lands, have a yellowish-brown to dark-brown silt loam surface layer and a yellowish-brown to dark-brown subsoil. These soils on bottom lands are similar to the Haymond, Wilbur, and Wakeland soils in general soil area 1, but they need lime. Although the soils are flooded occasionally, the damage to crops is not serious. The Stendal soils are very well suited to tile drainage.

The Haubstadt, Otwell, Dubois, and Robinson soils make up 4 percent of this area. They are on terraces. These soils are medium textured. They have a dark grayish-brown to light-gray surface soil and a light-gray to yellowish-brown subsoil. On slopes, they erode readily. The Dubois and Robinson soils need artificial drainage.

The Pope, Philo, and Stendal soils are cultivated continuously for field corn, sweet corn, soybeans, and cabbage. The poorly drained Atkins soils are not well suited to cultivated crops. Corn, soybeans, small grains, hay, and pasture are the main crops on the Haubstadt, Otwell, Dubois, and Robinson soils.

General Soil Area 3

The Clermont, Avonburg, Rossmoyne, Whitcomb, and Cana soils are the principal soils in this general soil area (fig. 4). These soils have slopes of 0 to 6 percent in this area. They are the most productive upland soils in the county. Their natural fertility is low, but they respond well to lime and fertilizer. Additions of plant residue also improve these soils. These soils are acid and poorly drained to moderately well drained. This soil area occupies 37 percent of the county.

The Clermont, Avonburg, and Whitcomb soils make up 42 percent of this area. They have a mottled gray, yellow, and brown subsoil and a fragipan at a depth of about 2 feet. They need artificial drainage. The Avonburg and Whitcomb soils are imperfectly drained and have a very dark grayish-brown to brown surface layer.

The Rossmoyne and Cana soils make up about 49 percent of this area. They are gently sloping and moderately well drained. Uneroded areas have a dark-brown to dark yellowish-brown silt loam surface layer. Part of the surface layer has been lost through erosion in some places, and the remaining surface layer has been mixed with the subsoil by plowing. In these places the surface layer is yellowish brown.

The Trappist, Jennings, and Johnsburg soils make up 9 percent of this general soil area. Their acreage is scattered in the southern half of the county.

The main crops in this general soil area are corn, soybeans, small grains, and legume-grass hay.

General Soil Area 4

This general soil area consists mainly of Cincinnati, Jennings, Grayford, and Zanesville soils that have slopes of 6 to 35 percent (fig. 5). Most of the steeper acreage is adjacent to bottom lands and terraces. These soils are deep, acid, and well drained. They developed in glacial drift and in material weathered from bedrock. Although natural fertility is low, these soils respond well to lime and fertilizer. They are improved by additions of plant residue. This soil area makes up 29 percent of the county.

Figure 5.—General soil area 4. Sloping to strongly sloping soils that need good management, including additions of lime and fertilizer.

About 74 percent of this area is Cincinnati and Jennings soils, which developed in glacial drift. About 16 percent of the area is Zanesville, Trappist, and Colyer soils. These soils developed in material weathered from bedrock. The Zanesville and the Trappist soils are more extensive than the Colyer soils in this general soil area. The Zanesville soils have a fragipan at depths of 36 to 48 inches. Their parent material weathered from acid sandstone and shale. The Trappist soils are underlain by dark-brown to black oil shale (fig. 6). In the south-central and southeastern parts of the county the shale overlies limestone.

About 10 percent of this area is in Grayford soils, Parke soils, and Jennings soils that have a mixed or a heavy substratum. Other soils are scattered in small areas through the southern half of the county.

The uneroded soils in this area have a dark-brown to yellowish-brown, friable surface soil and a dark-brown to brownish-yellow subsoil. The surface soil and subsoil in eroded areas is dark-brown to brownish-yellow silt loam, except where the subsoil is exposed and the top layer is finer than silt loam. Glacial pebbles, chert, or shale fragments are on the surface of eroded areas.

About 26 percent of this general soil area is wooded. The rest is in permanent pasture or crops, or is idle. Corn, soybeans, wheat, and grass-legume hay are commonly grown. If these soils are used for crops, however, erosion must be controlled.

General Soil Area 5

This general soil area is in the southwestern and south-central parts of the county in an area that is locally called the Knobs (fig. 7). It occupies about 7 percent of the county. It consists mainly of the Muskingum, Wellston, and Kinderhook soils that have slopes of 25 to 70 percent. These soils are well drained to excessively drained. At depths of less than 36 inches, they are

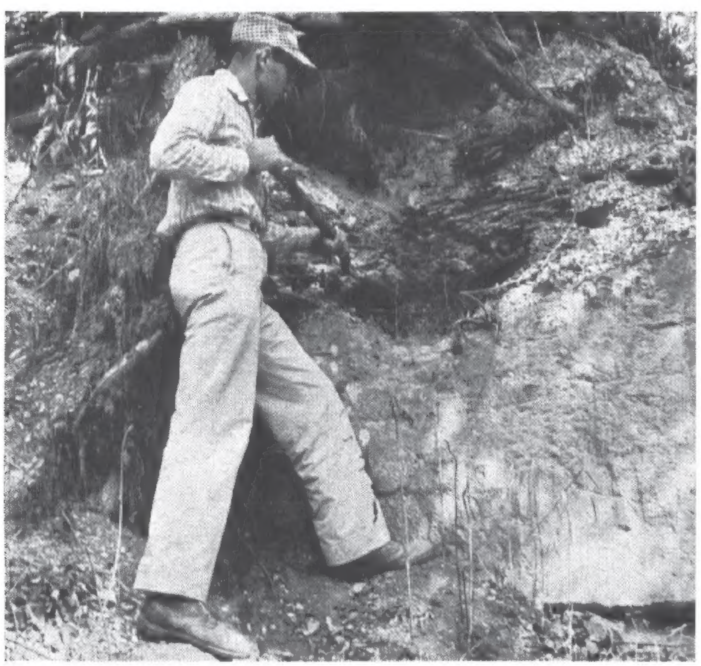

Figure 6.—**Black oil shale from which Trappist soils have formed.**

Figure 7.—**General soil area 5 in the rough Knobs area. Parent rock and parent material of Muskingum, Wellston, and Kinderhook soils.**

underlain by acid sandstone and shale. Some of the principal soils in this general soil area are shown in relationship to the underlying material in the section "Formation, Classification, and Morphology of Soils."

The Muskingum soils make up 62 percent of this general area, and the Wellston soils, 30 percent. The Muskingum and Wellston soils have a dark grayish-brown to yellowish-brown surface soil and a brown to dark yellowish-brown subsoil. Fragments of sandstone and brown shale occur through their profiles. The Kinderhook soils make up about 8 percent of this area and are less productive than the Muskingum and Wellston soils. They have a grayish-brown surface layer and a grayish-brown to light olive-brown subsoil. At depths of less than 42 inches, the subsoil is underlain by neutral shale, or soapstone.

Small areas of Zanesville, Tilsit, and Johnsburg soils are also in this general soil area. These soils are deep, but a fragipan restricts the penetration of roots and moisture.

Most of this general soil area is in trees, which make slow growth. Part of the area has been cleared and is reforested to Virginia pine. This pine is well suited to these soils. Small areas are in pasture, but these soils are not well suited to pasture.

Descriptions of Soils

In the following pages the soil series of Scott County are described in alphabetic order. These series descriptions point out important characteristics of the soils in the series. They tell generally the position of the soils in the landscape and the location of the soils in the county. A profile of a soil representative of the series is described, and variations of the soils within the series are discussed.

Following the description of the soil series are brief descriptions of the individual soils, or mapping units, in the series. These descriptions may compare the soil described to the soil representative of the series. Generally, something about use and management is stated. For more information on use and management, turn to the discussion of the capability unit into which

the soil has been placed. This unit is named at the end of each soil description.

The acreage and proportionate extent of each soil in the county are listed in table 1. The location and distribution of the soils are shown on the soil map at the back of this report. Terms that may not be familiar are defined in the Glossary.

Atkins Series

The Atkins series consists of deep, poorly drained, medium-textured soils. These soils are mainly in nearly level areas on broad bottom lands and along the base of hills and terraces. Some areas are in slight depressions. The Atkins soils occur mostly in the northwestern part of the county. They are developing in alluvial materials washed from loess, sandstone, shale, and Illinoian till. The native vegetation was water-tolerant trees.

These soils have a gray to grayish-brown surface layer faintly mottled with dark yellowish brown. When dry, this layer is light gray or nearly white. It is 6 to 18 inches thick and is underlain by grayish, medium-textured material that is mottled with yellowish brown, brown, and gray.

The Atkins soils in this county have a total area of about 3 square miles. They occur with the Stendal soils but are wetter and more difficult to drain than those soils.

Representative profile (Atkins silt loam, in woods 100 feet west of road in NE¼SE¼NE¼ sec. 3, T. 3 N., R. 6 E.):

A_1 0 to 6 inches, gray to grayish-brown (10YR 5/1 to 5/2, moist) heavy silt loam mottled with dark yellowish brown (10YR 3/4, moist); mottles are many, fine, and faint; weak, coarse, granular structure; friable to firm when moist; strongly acid; 5 to 7 inches thick; boundary clear and wavy.

C_1 6 to 12 inches, gray (10YR 6/1, moist) silt loam mottled with dark brown (10YR 4/3, moist) and yellowish red (5YR 5/6, moist); mottles are many, fine, and faint; weak, coarse, subangular blocky structure; friable when moist; strongly acid; 4 to 8 inches thick; boundary gradual and irregular.

C_2 12 to 49 inches, mottled gray (10YR 5/1 to 6/1, moist), yellowish-brown (10YR 5/4 to 5/6, moist), and reddish-gray (5YR 5/2, moist) silty clay loam; mottles are many, fine, and prominent; very weak, medium, subangular blocky structure; firm when moist and slightly sticky when wet; strongly acid; many black (7.5YR N2/0) iron concretions; 35 to 40 inches thick.

C_3 49 to 85 inches, gray (10YR 5/1 to 6/1, moist) silty clay loam; firm when moist and sticky when wet; strongly acid.

C_4 85 to 91 inches, dark-brown (10YR 3/3, moist) organic layer; slightly acid.

C_5 91 inches +, appears to be gleyed; slightly acid.

In some places the lower horizons are fine silty clay loam; in others the entire profile is silt loam. A few areas in the northwestern part of the county have a dark-brown organic layer at depths of 6 to 8 feet. Small spots at the base of hills are underlain by stratified layers of sand, shale fragments, silt, and clay. In these areas seepage keeps the soils wet.

The Atkins soils have very slow surface runoff and slow permeability. If they have not been limed, they are strongly acid.

Atkins silt loam (At).—This is the only Atkins soil mapped in the county. It has a profile like the one described for the series. It is frequently flooded and is also kept wet by seepage from nearby soils on uplands. Most of the acreage is in woods and is best suited to that use. This soil is difficult to drain, but a few areas have been drained and planted to soybeans and corn with some success. (Capability unit Vw-1.)

Avonburg Series

The Avonburg series consists of deep, imperfectly drained, medium-textured soils on uplands. These soils are nearly level to gently sloping and occur throughout the county. They developed in leached, silty loess that extends to depths of 40 to 80 inches. The loess is underlain by leached Illinoian till. Calcareous till is normally at depths of 10 to 12 feet or more. These soils formed under forest vegetation.

The surface layers (A horizon) are very dark grayish-brown to grayish-brown silt loam, 6 to 14 inches thick. The upper part of the subsoil is light yellowish-brown silt loam to silty clay loam mottled with light brownish gray. This layer is underlain by light yellowish-brown to dark grayish-brown silt loam mottled with light gray to brownish yellow. This material, in most places, is dense and brittle and is called a fragipan.

The Avonburg soils in this county have a total area of about 27 square miles. They occur with the Rossmoyne and Cana soils, which are moderately well drained. They resemble the Whitcomb soils, but the underlying till is thicker over the shale bedrock in the Avonburg soils.

Representative profile (Avonburg silt loam, 0 to 2 percent slopes, in SW¼SE¼ sec. 21, T. 3 N., R. 7 E., in woods 100 feet northwest of a draw and 200 feet north of its southern edge):

A_0 1 to 0 inch, accumulated layer of partly decomposed forest litter from deciduous trees; ½ to 1½ inches thick.

A_1 0 to 3 inches, very dark grayish-brown (10YR 3/2, moist) silt loam; weak, fine, granular structure; very friable when moist; slightly acid to medium acid; 2 to 3 inches thick.

A_{21} 3 to 7 inches, brown to pale-brown (10YR 5/3 to 6/3, moist) silt loam; weak, fine, granular to weak, fine, subangular blocky structure; friable when moist; strongly acid; 3 to 5 inches thick.

A_{22} 7 to 10 inches, light yellowish-brown (10YR 6/4, moist) silt loam mottled with light brownish gray (10YR 6/2, moist); mottles are many, fine, and faint; weak, fine, subangular blocky structure; friable when moist; strongly acid; 2 to 4 inches thick.

B_1 10 to 19 inches, light yellowish-brown (10YR 6/4, moist) silt loam to light silty clay loam mottled with light brownish gray (10YR 6/2, moist); mottles are many, fine, and faint; weak, fine, subangular blocky structure; friable when moist; strongly acid; 8 to 12 inches thick.

B_{21} 19 to 27 inches, light yellowish-brown (10YR 6/4, moist) silt loam; few, fine, faint mottles of light gray (10YR 7/2, moist); weak, fine, subangular blocky structure; friable when moist; strongly acid to very strongly acid; 9 to 12 inches thick.

B_{2m} 27 to 41 inches, dark grayish-brown (10YR 4/2, moist) silt loam with white (10YR 8/2, moist) to very pale brown (10YR 8/3, moist) coatings of silt; few rounded concretions and till pebbles; strong, coarse to very coarse, subangular blocky structure; extremely firm when moist; strongly acid; 13 to 18 inches thick.

B_{3m} 41 to 60 inches, mottled gray (10YR 6/1, moist) and brownish-yellow (10YR 6/6 to 6/8, moist) silt loam; mottles are many, coarse, and faint; moderate, coarse, prismatic structure that breaks into coarse to very coarse, subangular blocky structure; the pebbles and weathered rock fragments increase with depth; firm to extremely firm when moist; strongly acid, becoming less acid with increasing depth.

C 60 inches +, leached Illinoian till; becomes calcareous at depths of 120 inches or more.

TABLE 1.—*Approximate acreage and proportionate extent of soils*

Soil	Area	Proportionate extent
	Acres	*Percent*
Atkins silt loam	1, 849	1. 5
Avonburg silt loam, 0 to 2 percent slopes	16, 711	13. 5
Avonburg silt loam, 2 to 6 percent slopes	156	. 1
Avonburg silt loam, 2 to 6 percent slopes, moderately eroded	273	. 2
Cana silt loam, 0 to 2 percent slopes	246	. 2
Cana silt loam, 2 to 6 percent slopes	816	. 7
Cana silt loam, 2 to 6 percent slopes, moderately eroded	4, 432	3. 6
Cana soils, 2 to 6 percent slopes, severely eroded	157	. 1
Cincinnati silt loam, 2 to 6 percent slopes	70	. 1
Cincinnati silt loam, 2 to 6 percent slopes, moderately eroded	595	. 5
Cincinnati silt loam, 6 to 12 percent slopes	817	. 7
Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded	2, 390	1. 9
Cincinnati silt loam, 12 to 18 percent slopes	1, 027	. 8
Cincinnati silt loam, 12 to 18 percent slopes, moderately eroded	402	. 3
Cincinnati silt loam, 18 to 25 percent slopes	1, 104	. 9
Cincinnati silt loam, 18 to 25 percent slopes, moderately eroded	311	. 3
Cincinnati silt loam, 25 to 35 percent slopes	385	. 3
Cincinnati silt loam, 25 to 35 percent slopes, moderately eroded	120	. 1
Cincinnati soils, 6 to 12 percent slopes, severely eroded	4, 367	3. 5
Cincinnati soils, 12 to 18 percent slopes, severely eroded	1, 796	1. 5
Cincinnati soils, 18 to 25 percent slopes, severely eroded	423	. 3
Clermont silt loam	2, 013	1. 6
Colyer soils, 12 to 25 percent slopes	156	. 1
Colyer soils, 25 to 60 percent slopes	829	. 7
Dubois silt loam, 0 to 2 percent slopes	2, 511	2. 0
Dubois silt loam, 2 to 6 percent slopes	71	. 1
Dubois silt loam, 2 to 6 percent slopes, moderately eroded	104	. 1
Grayford silt loam, 2 to 6 percent slopes	52	([1])
Grayford silt loam, 2 to 6 percent slopes, moderately eroded	148	. 1
Grayford silt loam, 6 to 12 percent slopes, moderately eroded	62	. 1
Grayford silt loam, 12 to 18 percent slopes, moderately eroded	21	([1])
Grayford silt loam, 18 to 25 percent slopes	51	([1])
Grayford silt loam, 18 to 35 percent slopes, moderately eroded	39	([1])
Grayford silt loam, 25 to 35 percent slopes	51	([1])
Grayford soils, 6 to 12 percent slopes, severely eroded	79	. 1
Grayford soils, 12 to 18 percent slopes, severely eroded	33	([1])
Gullied land, acid shale materials	2, 587	2. 1
Gullied land, neutral shale materials	228	. 2
Gullied land, glacial materials	964	. 8
Haubstadt silt loam, 2 to 6 percent slopes	481	. 4
Haubstadt silt loam, 2 to 6 percent slopes, moderately eroded	903	. 7
Haubstadt soils, 2 to 6 percent slopes, severely eroded	66	. 1
Haymond silt loam, 0 to 2 percent slopes	2, 037	1. 6
Haymond silt loam, 2 to 6 percent slopes	146	. 1
Haymond silt loam, high bottom, 0 to 2 percent slopes	156	. 1
Haymond silt loam, high bottom, 2 to 6 percent slopes	63	. 1
Jennings silt loam, mixed substratum, 6 to 12 percent slopes	60	([1])
Jennings silt loam, mixed substratum, 6 to 12 percent slopes, moderately eroded	134	. 1
Jennings silt loam, mixed substratum, 12 to 18 percent slopes	54	([1])
Jennings silt loam, mixed substratum, 18 to 25 percent slopes	46	([1])
Jennings soils, mixed substratum, 6 to 12 percent slopes, severely eroded	207	0. 2
Jennings soils, mixed substratum, 12 to 18 percent slopes, severely eroded	254	. 2
Jennings silt loam, heavy substratum, 2 to 6 percent slopes	79	. 1
Jennings silt loam, heavy substratum, 2 to 6 percent slopes, moderately eroded	196	. 2
Jennings silt loam, heavy substratum, 6 to 12 percent slopes	61	([1])
Jennings silt loam, heavy substratum, 6 to 12 percent slopes, moderately eroded	213	. 2
Jennings silt loam, heavy substratum, 12 to 18 percent slopes	197	. 2
Jennings silt loam, heavy substratum, 12 to 18 percent slopes, moderately eroded	83	. 1
Jennings silt loam, heavy substratum, 18 to 25 percent slopes	198	. 2
Jennings silt loam, heavy substratum, 25 to 35 percent slopes	28	([1])
Jennings soils, heavy substratum, 6 to 12 percent slopes, severely eroded	368	. 3
Jennings soils, heavy substratum, 12 to 18 percent slopes, severely eroded	153	. 1
Jennings soils, heavy substratum, 18 to25 percent slopes, severely eroded	59	([1])
Jennings silt loam, 2 to 6 percent slopes	93	. 1
Jennings silt loam, 2 to 6 percent slopes, moderately eroded	463	. 4
Jennings silt loam, 6 to 12 percent slopes	762	. 6
Jennings silt loam, 6 to 12 percent slopes, moderately eroded	1, 731	1. 4
Jennings silt loam, 12 to 18 percent slopes	921	. 7
Jennings silt loam, 12 to 18 percent slopes, moderately eroded	533	. 4
Jennings soils, 2 to 6 percent slopes, severely eroded	96	. 1
Jennings soils, 6 to 12 percent slopes, severely eroded	3, 444	2. 8
Jennings soils, 12 to 18 percent slopes, severely eroded	914	. 7
Jennings and Colyer silt loams, 18 to 25 percent slopes	1, 116	. 9
Jennings and Colyer silt loams, 18 to 25 percent slopes, moderately eroded	333	. 3
Jennings and Colyer soils, 18 to 25 percent slopes, severely eroded	234	. 2
Johnsburg silt loam	163	. 1
Kinderhook silty clay loam, 12 to 18 percent slopes	140	. 1
Kinderhook silty clay loam, 18 to 35 percent slopes	423	. 3
Made land	935	. 8
Muskingum silt loam, 25 to 35 percent slopes	1, 960	1. 6
Muskingum silt loam, 35 to 70 percent slopes	3, 197	2. 6
Otwell silt loam, 2 to 6 percent slopes	52	([1])
Otwell silt loam, 6 to 12 percent slopes, moderately eroded	204	. 2
Otwell silt loam, 12 to 18 percent slopes	73	. 1
Otwell silt loam, 18 to 25 percent slopes	27	([1])
Otwell soils, 6 to 12 percent slopes, severely eroded	313	. 3
Otwell soils, 12 to 18 percent slopes, severely eroded	134	. 1
Otwell soils, 18 to 25 percent slopes, severely eroded	23	([1])
Parke silt loam, 2 to 6 percent slopes, moderately eroded	80	. 1

TABLE 1.—*Approximate acreage and proportionate extent of soils*—Continued

Soil	Area	Proportionate extent
	Acres	*Percent*
Parke silt loam, 6 to 12 percent slopes, moderately eroded	70	0.1
Parke silt loam, 12 to 18 percent slopes	85	.1
Parke silt loam, 18 to 25 percent slopes	199	.2
Parke soils, 6 to 12 percent slopes, severely eroded	62	.1
Parke soils, 12 to 18 percent slopes, severely eroded	124	.1
Philo silt loam, 0 to 2 percent slopes	2,380	1.9
Philo silt loam, 2 to 6 percent slopes	344	.3
Pope silt loam	693	.6
Robinson silt loam	133	.1
Rossmoyne silt loam, 0 to 2 percent slopes	1,245	1.0
Rossmoyne silt loam, 2 to 6 percent slopes	3,147	2.5
Rossmoyne silt loam, 2 to 6 percent slopes, moderately eroded	10,771	8.7
Rossmoyne silt loam, 6 to 12 percent slopes, moderately eroded	75	.1
Rossmoyne soils, 2 to 6 percent slopes, severely eroded	361	.3
Rossmoyne soils, 6 to 12 percent slopes, severely eroded	74	.1
Stendal silt loam	16,442	13.3
Tilsit silt loam, 0 to 2 percent slopes	53	(1)
Tilsit silt loam, 2 to 6 percent slopes	408	.3
Tilsit silt loam, 2 to 6 percent slopes, moderately eroded	760	.6
Trappist silt loam, moderately well drained, 2 to 6 percent slopes	41	(1)
Trappist silt loam, moderately well drained, 2 to 6 percent slopes, moderately eroded	256	.2
Trappist silt loam, 2 to 6 percent slopes	90	.1
Trappist silt loam, 2 to 6 percent slopes, moderately eroded	123	.1
Trappist silt loam, 6 to 12 percent slopes	149	.1
Trappist silt loam, 6 to 12 percent slopes, moderately eroded	380	.3
Trappist silt loam, 12 to 25 percent slopes	882	.7
Trappist silt loam, 12 to 25 percent slopes, moderately eroded	439	.4
Trappist soils, 6 to 12 percent slopes, severely eroded	633	.5
Trappist soils, 12 to 25 percent slopes, severely eroded	425	0.3
Wakeland silt loam	1,293	1.0
Wellston silt loam, 2 to 6 percent slopes	160	.1
Wellston silt loam, 6 to 12 percent slopes	141	.1
Wellston silt loam, 12 to 18 percent slopes	449	.4
Wellston silt loam, 12 to 18 percent slopes, moderately eroded	75	.1
Wellston silt loam, 18 to 25 percent slopes	1,295	1.0
Wellston silt loam, 18 to 25 percent slopes, moderately eroded	89	.1
Wellston soils, 12 to 18 percent slopes, severely eroded	63	.1
Wellston soils, 18 to 25 percent slopes, severely eroded	42	(1)
Whitcomb silt loam	546	.4
Wilbur silt loam, 0 to 2 percent slopes	2,410	2.0
Wilbur silt loam, high bottom, 0 to 2 percent slopes	86	.1
Wilbur silt loam, high bottom, 2 to 6 percent slopes	220	.2
Zanesville silt loam, 2 to 6 percent slopes, moderately eroded	55	(1)
Zanesville silt loam, 6 to 12 percent slopes	402	.3
Zanesville silt loam, 6 to 12 percent slopes, moderately eroded	364	.3
Zanesville silt loam, 12 to 18 percent slopes	351	.3
Zanesville silt loam, 12 to 18 percent slopes, moderately eroded	143	.1
Zanesville silt loam, 18 to 25 percent slopes	159	.1
Zanesville soils, 6 to 12 percent slopes, severely eroded	422	.3
Zanesville soils, 12 to 18 percent slopes, severely eroded	277	.2
Zanesville soils, 18 to 25 percent slopes, severely eroded	36	(1)
Subtotal	122,944	
Quarries	36	(1)
Water	540	.4
Total	123,520	

1 Less than 1/10 of 1 percent.

The surface layers are 6 to 14 inches thick. The compact layer, or fragipan, normally occurs at depths of 2 to 3 feet. This layer varies in thickness from place to place. The depth to shale ranges from 6 to 30 feet. Where this depth is less than 12 feet, the Illinoian till is noncalcareous in places.

Avonburg soils have slow surface runoff and slow permeability. The penetration of roots is restricted by the fragipan. These soils are low in natural fertility. Where they have not been limed, they are strongly acid

Avonburg silt loam, 0 to 2 percent slopes (AvA).—The profile of this soil is like the one described for the series. Most areas of this soil need artificial drainage. Use diversion terraces to carry away runoff from higher ground. This soil is well suited to row crops in a cropping system that includes a small grain and meadow. (Capability unit IIw-1.)

Avonburg silt loam, 2 to 6 percent slopes (AvB).—This soil is more sloping than Avonburg silt loam, 0 to 2 percent slopes. The depth to mottling is 12 to 15 inches. In addition to artificial drainage, protection against the slight erosion hazard is needed if row crops are grown. Remove excess water by grassed waterways, and break long slopes with diversion terraces. This soil is well suited to row crops in a cropping system with a small grain and meadow. (Capability unit IIw-1.)

Avonburg silt loam, 2 to 6 percent slopes, moderately eroded (AvB2).—This soil has lost part of its original surface soil through erosion. In many places the subsoil is exposed or has been mixed with the remaining surface soil. Additions of organic matter may be needed to improve tilth. Where water needs to be diverted from higher land, use grassed waterways to prevent gullying. This soil is well suited to row crops in a cropping system with a small grain and meadow. The row crops, however, should not be grown so long as on the uneroded Avonburg silt loams. Yields are lower on this eroded soil than on the uneroded Avonburg soils. (Capability unit IIw-1.)

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Cana Series

The Cana series consists of deep, moderately well drained, medium-textured soils on uplands. These soils are nearly level to gently sloping and occur mostly in the north-central and eastern parts of the county. They developed in loess that extends to depths of 12 to 30 inches, and they are underlain by a layer of till. The till, in turn, is underlain by dark-brown to black shale, or slate, at depths of 40 to 72 inches. These soils formed under forest vegetation.

The surface soil is brown to yellowish-brown silt loam. The subsoil is yellowish-brown or dark yellowish-brown silt loam to silty clay loam. A weak fragipan is in the lower part of the subsoil.

The Cana soils in this county have a total area of about 9 square miles. They occur with the well-drained Jennings and the imperfectly drained Whitcomb soils. They are somewhat similar to the Rossmoyne soils. The Cana soils, however, have many shale fragments, mixed with glacial till, in the lower part of the subsoil, but the subsoil in the Rossmoyne soils has few or no shale fragments. Also, the Cana soils are shallower to shale than the Rossmoyne soils and are normally acid above the shale, whereas the Rossmoyne soils are neutral or calcareous.

Representative profile (Cana silt loam, 2 to 6 percent slopes, east of highway in NW¼SW¼NE¼ sec. 11, T. 3 N., R. 7 E.):

A_0 ½ to 0 inch, partly decomposed grasses and twigs.

A_1 0 to 4 inches, brown (10YR 4/3, moist) silt loam; weak, fine, granular structure; very friable when moist; slightly acid; 3 to 5 inches thick; boundary clear and wavy.

A_2 4 to 8 inches, brown (10YR 4/3, moist) silt loam; weak, thin, platy and weak, fine, granular structure; very friable when moist; medium acid; 3 to 5 inches thick; boundary clear and wavy.

A_3 8 to 11 inches, dark yellowish-brown to yellowish-brown (10YR 4/4 to 5/4, moist) silt loam; weak, medium, platy and weak, medium, granular structure; friable when moist; strongly acid to medium acid; 2 to 4 inches thick; boundary clear and wavy.

B_1 11 to 19 inches, yellowish-brown (10YR 5/4, moist) silt loam; moderate, fine to medium, subangular blocky structure; friable when moist; strongly acid to medium acid; 6 to 9 inches thick; boundary clear and wavy.

B_{21} 19 to 25 inches, yellowish-brown (10YR 5/6, moist) light silty clay loam mottled with light brownish gray (10YR 6/2, moist); mottles are few, fine, and faint; weak, medium, subangular blocky structure; slightly firm when moist; strongly acid to medium acid; 4 to 7 inches thick; boundary clear and wavy.

B_{22} 25 to 31 inches, mottled dark yellowish-brown (10YR 4/4, moist), yellowish-brown (10YR 5/6, moist), and light brownish-gray (10YR 6/2, moist) silty clay loam; mottles are common, fine, and faint; moderate, thick, platy and medium, angular and subangular blocky structure; firm when moist; strongly acid to medium acid; 5 to 7 inches thick; boundary clear and wavy.

B_{2m} 31 to 49 inches, yellowish-brown (10YR 5/6, moist) silty clay loam with gray (10YR 5/1, moist) coatings on vertical cracks and ped faces; weak, medium, prismatic structure breaking into weak, coarse, subangular blocky structure; firm when moist; strongly acid; 12 to 19 inches thick; boundary gradual and wavy.

B_3 49 to 61 inches, yellowish-brown (10YR 5/6, moist) silty clay loam mottled with gray (10YR 5/1, moist); mottles are many, medium, and faint; weak, coarse, subangular blocky structure; firm when moist; many shale fragments mixed with the glacial till; strongly acid; 10 to 14 inches thick; boundary abrupt and wavy.

D_1 61 to 72 inches, gray (10YR 5/1, moist) and yellowish brown (10YR 5/8, moist), partly weathered, thick, platy shale; shale plates are yellowish brown (10YR 5/6 to 5/8) inside; strongly acid; 8 to 14 inches thick; boundary gradual and wavy.

D_r 72 inches +, consolidated acid New Albany shale; very dark brown (10YR 2/2, moist) inside and grayish brown (10YR 5/2, moist) outside.

In some places the surface layers (A horizon) are 12 inches thick; in others the subsoil is exposed. The thickness of the loess ranges from 12 to 30 inches, and the depth to weathered shale, from 40 to 72 inches. In most places, rounded pebbles and fragments of glacial rock are in the B_{2m} horizon and in lower horizons. In the upper horizons these pebbles are rounded; in the lower horizons they are angular.

The Cana soils are moderately permeable, but the fragipan in the lower part of the subsoil restricts the penetration of roots. These soils are low in organic-matter content and in natural fertility. If they have not been limed, they are medium acid to strongly acid. Surface runoff is slow to medium.

Cana silt loam, 0 to 2 percent slopes (CaA).—This soil, in most places, has brown silt loam surface layers (A horizon), 9 to 12 inches thick. In a few small areas, these layers are 6 to 9 inches thick. Shale is at depths of 5 to 6 feet. This soil is well suited to row crops grown in a cropping system with a small grain and meadow. The row crops can be grown satisfactorily for as many as 3 consecutive years if well fertilized and managed. (Capability unit I–1.)

Cana silt loam, 2 to 6 percent slopes (CaB).—This soil has a profile like the one described for the series. The soil is more sloping than Cana silt loam, 0 to 2 percent slopes, and more susceptible to erosion. The risk of erosion can be reduced by stripcropping and contour tillage. If erosion is controlled, row crops can be grown 2 years in 5 in a cropping system that includes a small grain and meadow. (Capability unit IIe–1.)

Cana silt loam, 2 to 6 percent slopes, moderately eroded (CaB2).—This soil is more severely eroded than Cana silt loam, 2 to 6 percent slopes, and is lighter colored and thinner in the surface layers (A horizon). Through tillage, the yellowish-brown subsoil material has been mixed with the remaining surface layers. These layers were only 4 to 8 inches thick before mixing. Shale is at depths of 4 to 6 feet.

Protect this soil against erosion by planting cover crops and by leaving crop residue on the surface. If it is stripcropped and terraced, this soil can be used for row crops in a cropping system that includes a small grain and meadow. (Capability unit IIe–1.)

Cana soils, 2 to 6 percent slopes, severely eroded (CbB3).—These soils have had most of their original surface soil washed away, and the plow layer consists mainly of the yellowish-brown subsoil material. Pebbles from glacial till and very small fragments of shale are on the surface. Small grains and meadow are the most suitable crops, but row crops can be grown if the soils are stripcropped and terraced. (Capability unit IVe–1.)

Cincinnati Series

The Cincinnati series consists of deep, well-drained, medium-textured soils on uplands. These soils are gently sloping to steep and occur mostly in the west-central, central, and eastern parts of the county. They

developed in loess that extends to depths of 10 to 40 inches. The loess is underlain by Illinoian till, and the till, in turn, by oil-bearing shale or "slate". These soils formed under forest vegetation. Their surface soil is brown to dark-brown silt loam, and their subsoil, brown to yellowish-brown silt loam to silty clay loam.

The Cincinnati soils in this county have a total area of about 21 square miles. They occur with the moderately well drained Rossmoyne soils and with the well-drained Grayford soils. They are similar to the Grayford soils but are less red and contain less clay in the subsoil. The Cincinnati soils are somewhat similar to the well-drained Jennings soils but are deeper to oil-bearing shale. The Cincinnati soils are more than 72 inches to shale, and the Jennings soils are 40 to 72 inches. In the Cincinnati soils the loamy till above the shale is strongly acid to calcareous, but in the Jennings soils the till is strongly acid.

Representative profile (Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded, 330 feet west of private lane in NE¼SW¼ sec. 7, T. 3 N., R. 7 E.):

A_p 0 to 8 inches, dark-brown (10YR 4/3, moist) silt loam; weak, fine, granular structure; friable when moist and nonsticky when wet; neutral; 5 to 8 inches thick; boundary abrupt and smooth.

B_1 8 to 11 inches, dark-brown (7.5YR 4/4 moist) silt loam; weak, fine to medium, subangular and angular blocky structure; friable when moist; medium acid; 1 to 3 inches thick; boundary clear and smooth.

B_{21} 11 to 24 inches, dark-brown (7.5YR 4/4, moist) silty clay loam; moderate, medium to coarse, subangular blocky structure; slightly firm when moist and slightly sticky when wet; medium acid; 12 to 17 inches thick; boundary gradual and wavy.

B_{22} 24 to 43 inches, light yellowish-brown (10YR 6/4, moist) to strong-brown (7.5YR 5/6, moist) silty clay loam to clay loam; weak, medium to coarse, subangular blocky structure; friable when moist; strongly acid; 18 to 24 inches thick; boundary clear and wavy.

B_{23} 43 to 51 inches, strong-brown (7.5YR 5/6, moist) clay loam streaked with pale brown (10YR 6/3, moist); weak, medium to coarse, angular blocky structure; firm when moist and sticky when wet; strongly acid.

B_3 51 to 77 inches, dark yellowish-brown to yellowish-brown (10YR 4/4 to 5/6, moist) sandy clay loam to clay loam with very dark brown (10YR 2/2, moist) manganese stains; firm when moist; strongly acid.

C_1 77 to 98 inches, strong-brown (7.5YR 5/6, moist) loam; firm when moist; medium acid.

C_2 98 to 104 inches, yellowish-brown (10YR 5/8, moist) loam; slightly firm when moist; neutral.

The thickness of loess in the Cincinnati soils ranges from 0 to 40 inches, depending on the steepness of slope and the amount of erosion. The glacial till is calcareous at depths of 8 to 12 feet. Where the glacial till deposits are thin, at depths greater than 6 feet there is consolidated dark-brown to black shale; neutral, grayish-green shale, commonly called soapstone; or acid, stratified sandstone and brown shale. Where the depth to these formations is less than 8 to 12 feet, the neutral or calcareous layer of loamy till is very thin or is absent. From the lower part of the subsoil downward, the number of coarse sand and rock fragments increases as the depth increases.

The Cincinnati soils have medium to very rapid surface runoff and slow to moderate permeability.

Cincinnati silt loam, 2 to 6 percent slopes (CcB).—This soil is in wooded areas on narrow ridgetops. Little of the material in the surface layer (A horizon) has washed away. The surface layer (A horizon) is 12 inches thick, which is thicker than that in the profile described for the series. In other respects the profile of this soil is similar to that described for the series. Surface runoff is medium, and the permeability is moderate. This soil is suited to row crops grown in a cropping system that includes a small grain and meadow. (Capability unit IIe-1.)

Cincinnati silt loam, 2 to 6 percent slopes, moderately eroded (CcB2).—This soil has surface layers (A horizon) that are 5 to 8 inches thick. These layers are normally lighter in color than the surface layers in the profile described for the series. Some of the yellowish-brown subsoil has been mixed with the original surface layers by tillage. Surface runoff is medium, and permeability is moderate.

Included with this moderately eroded soil are some severely eroded areas. Glacial pebbles are on the surface of these areas, which have gullies 1 to 3 feet deep. These areas are shown on the map by symbols.

Row crops grow well on this soil in a cropping system that includes a small grain and meadow. Protect against erosion by contour tillage and stripcropping. (Capability unit IIe-1.)

Cincinnati silt loam, 6 to 12 percent slopes (CcC).—Most of this soil is in woods. Its surface layer (A horizon) is 8 to 12 inches thick, or slightly thicker than that in the profile described for the series. Surface runoff is medium, and the permeability is moderate. If this soil is cleared and managed well to prevent erosion, it can be used for row crops in a cropping system with a small grain and meadow. (Capability unit IIIe-1.)

Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded (CcC2).—The profile of this soil is similar to the one described for the series. Most of the material in the original surface layers has washed away, and only 3 to 8 inches remains. In cultivated areas the yellowish-brown subsoil is mixed with the original surface layer. The yellowish-brown subsoil is exposed in small spots. This soil has medium surface runoff and moderate permeability. It is susceptible to further erosion and needs protection if row crops are grown. The row crops should be planted only once in 5 years, and the soil should be terraced and stripcropped. Small grain can be grown for 1 year in a cropping system that provides 3 years of meadow. (Capability unit IIIe-1.)

Cincinnati silt loam, 12 to 18 percent slopes (CcD).—This soil has a surface layer (A horizon) that is 8 to 10 inches thick, but in other respects its profile is like the one described for the series. Surface runoff is medium to rapid, and the permeability is moderate. Most of this soil is in woods. Erosion is a hazard, particularly in areas that have been cleared. If row crops are grown, the soil must be protected against erosion and a row crop planted only once in 5 years. The best use for this soil is probably permanent pasture or trees. (Capability unit IVe-2.)

Cincinnati silt loam, 12 to 18 percent slopes, moderately eroded (CcD2).—Except that only 3 to 8 inches of the original material in the brown surface layer (A horizon) remains, in most places this soil has a profile similar to that described for the series. In some places the yellowish-brown subsoil is exposed. Surface runoff is medium in areas where vegetation is thick and is rapid where vegetation is sparse. The permeability is moderate. The best use for this soil is probably permanent pasture or trees. (Capability unit IVe-2.)

Cincinnati silt loam, 18 to 25 percent slopes (CcE).—Most of this soil is in woods. Its brown silt loam surface layers (A horizon) are 8 to 10 inches thick, which is thicker than those in the profile described for the series. The mantle of loess in which the soil developed, however, is only 10 to 24 inches thick. This soil has moderate permeability. Surface runoff is rapid, and because of the steep slopes, erosion is a hazard. This soil is best suited to pasture, woods, and to habitats for wildlife. (Capability unit VIe–2.)

Cincinnati silt loam, 18 to 25 percent slopes, moderately eroded (CcE2).—The surface layer of this soil is only 3 to 8 inches thick because much of the material in the original surface layer (A horizon) has washed away. In places the plow layer is a mixture of the original surface layers and the yellowish-brown subsoil. The mantle of loess in which this soil developed is only 10 to 24 inches thick. Surface runoff is rapid on this moderately permeable soil, and erosion is a problem. The best use for this soil is pasture, woods, and habitats for wildlife. (Capability unit VIe–2.)

Cincinnati silt loam, 25 to 35 percent slopes (CcF).—This soil has a yellowish-brown silt loam surface layer about 8 inches thick. It is shallower than Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded, or about 4 to 8 feet to calcareous till or bedrock. Surface runoff is rapid to very rapid, and the permeability is moderate. Erosion is a hazard. Most of this soil is in woods, its best use. (Capability unit VIIe–3.)

Cincinnati silt loam, 25 to 35 percent slopes, moderately eroded (CcF2).—Erosion has removed much of the original surface layer from this soil. The present surface layer is a mixture of the original surface soil and the subsoil. Surface runoff is very rapid, and the permeability is moderate. This soil is too steep for crops. Woods or pasture is the best use. (Capability unit VIIe–1.)

Cincinnati soils, 6 to 12 percent slopes, severely eroded (CeC3).—These soils have had most of their original surface soil washed away. Less than 3 inches remains, and in cultivated areas, this has been mixed with the former subsoil. The surface soil now varies from heavy silt loam to silty clay loam. In other respects, the profile is like the one described for the series. Surface runoff on these moderately permeable soils is medium to rapid. Erosion is a serious problem. The soils are best suited to permanent pasture or meadow or for growing Christmas trees. If stripcropping is used, a row crop can be grown in a rotation with a small grain and meadow once in 5 years. (Capability unit IVe–1.)

Cincinnati soils, 12 to 18 percent slopes, severely eroded (CeD3).—These soils have had most of their original surface soil washed away. Less than 3 inches remains. Many pebbles from glacial till are on the surface, and in gullies, the glacial till parent material is exposed. Surface runoff is rapid, and the permeability is slow to moderate. Woods and permanent meadow or pasture are the best uses for these soils. Pines planted for Christmas trees grow well. (Capability unit VIe–1.)

Cincinnati soils, 18 to 25 percent slopes, severely eroded (CeE3).—Less than 3 inches of the original surface layer remains on these soils. Many pebbles from glacial till are on the surface, and in places gullies have dug into the subsoil. Surface runoff is rapid, and the permeability is slow to moderate. Erosion is a serious problem. Woods is the best use for these severely eroded soils. (Capability unit VIIe–2.)

Clermont Series

The Clermont series consists of deep, poorly drained, medium-textured soils on uplands. These soils are nearly level and occur in broad, flat areas, mainly in the northern part of the county. They developed in loess that extends to depths of 36 to 80 inches. The loess is underlain by Illinoian glacial till. The native vegetation was trees.

The surface layer of these soils is silt loam, which is dark grayish brown when moist and light gray to white when dry. The subsoil is heavy silt loam to silty clay loam mottled with gray, yellow, and brown.

The Clermont soils in this county have a total area of about 3 square miles. They occur with the Avonburg soils but are farther from the natural drainageways than those soils and are more poorly drained. Their surface layer and the upper part of their subsoil are grayer, or lighter in color, than those in the Avonburg soils.

Representative profile (Clermont silt loam, in the southeast corner of a woods in NW¼NE¼ sec. 26, T. 4 N., R. 7 E.):

A_0 1 to 0 inch, partly decomposed organic materials.

A_1 0 to 3 inches, dark grayish-brown (10YR 4/2, moist) silt loam; weak, fine, granular structure; friable when moist and sticky when wet; strongly acid; 2 to 3 inches thick; boundary abrupt and wavy.

A_{21} 3 to 11 inches, dark-brown (10YR 4/3, moist) silt loam mottled with light brownish gray (10YR 6/2, moist); mottles are many, fine, and faint; weak, thin, platy structure; friable when moist and sticky when wet; very strongly acid; 6 to 10 inches thick; boundary clear and irregular.

A_{22} 11 to 26 inches, gray (10YR 6/1, moist) silt loam mottled with dark brown (10YR 4/3, moist); mottles are many, medium, and distinct; weak, thick, platy structure; friable when moist and sticky when wet; very strongly acid; 13 to 17 inches thick; boundary gradual and irregular.

B_{21m} 26 to 36 inches, gray (10YR 6/1, moist) heavy silt loam mottled with dark brown (10YR 4/3, moist); mottles are many, medium, and distinct; weak, medium, columnar structure; firm when moist and sticky when wet; very strongly acid; 8 to 12 inches thick; boundary clear and wavy.

B_{22m} 36 to 50 inches, gray (10YR 6/1, moist) silty clay loam mottled with yellowish brown (10YR 5/6, moist); mottles are many, medium, and distinct; brown coatings on cleavage planes; weak, medium, columnar structure; very firm when moist and sticky when wet; very strongly acid; boundary clear and wavy.

B_{31} 50 to 72 inches, gray (10YR 6/1, moist) light silty clay loam to clay loam mottled with yellowish brown (10YR 5/6, moist); mottles are many, medium, and distinct; a few glacial pebbles and rock fragments; very strongly acid.

B_{32} and C_1 72 to 122 inches, gray (10YR 6/1, moist) to yellowish-brown (10YR 5/6, moist) silty clay loam to loam; more rock fragments than in layer above; very strongly acid to medium acid.

C_2 122 inches +, calcareous, loamy till.

In some areas the Clermont soils have a vesicular layer at depths of 12 to 24 inches. This layer contains many tiny holes, somewhat like those in a sponge. A fragipan extends from depths of 26 to 35 inches to depths of 50 to 60 inches. Calcareous, loamy till is at depths of 10 feet or more. Sand and fragments of glacial rock occur on the surface and downward, but the number of

till pebbles increases in the lower horizons. These pebbles vary in quantity from place to place.

If they have not been limed, the Clermont soils are strongly acid to very strongly acid. They have very slow surface runoff and permeability. Their organic-matter content and natural fertility are low.

Clermont silt loam (Cm).—This is the only Clermont soil mapped in Scott County. It has a profile like the one described for the series. It needs to be drained, but because permeability is very slow, tile lines are not satisfactory. The best way to drain this soil is by ditches that extend across the slope. This soil is suited to row crops in a cropping system that provides a small grain and meadow. (Capability unit IIIw–1.)

Colyer Series

The Colyer series consists of shallow, excessively drained, medium-textured soils on uplands. These soils are steep to very steep and occur mainly in the eastern part of the county. They developed in residuum from dark-brown to black, acid shale of the New Albany formation. The native vegetation was trees.

These soils have a yellowish-brown silt loam surface layer and subsoil. Weathered shale is at depths of less than 20 inches.

The Colyer soils in this county have a total area of about 2 square miles. They occur with the Trappist soils. They are more shallow than the Trappist soils and do not have a textural B horizon. The Colyer soils occur on steep slopes between the Jennings and the Trappist soils on uplands and the Stendal and the Atkins soils on bottom lands.

Representative profile (a Colyer soil on 25 to 60 percent slopes, 39 feet east of bridge on north side of road in SE¼SW¼NE¼ sec. 17, T. 3 N., R. 8 E.):

A_0 ½ to 0 inch, leaf litter and moss; ½ to 1 inch thick.

A_1 0 to 3 inches, yellowish-brown (10YR 5/4, moist) silt loam; moderate, fine, granular structure; friable when moist; strongly acid; 2 to 4 inches thick; boundary abrupt and wavy.

A_2 3 to 7 inches, yellowish brown (10YR 5/4, moist) silt loam; weak, thin to medium, platy structure; friable when moist; strongly acid; 4 to 6 inches thick; boundary abrupt and wavy.

BC 7 to 12 inches, yellowish-brown (10YR 5/4, moist) silt loam; weak, granular aggregates between weathered shale fragments; strongly acid; 5 to 8 inches thick; boundary abrupt and wavy.

D_1 12 to 37 inches, weathered shale with yellowish-brown (10YR 5/4, moist) faces and dark brown (10YR 4/3) inside; strongly acid; 20 to 30 inches thick; boundary abrupt and wavy.

D_r 37 inches +, dark-brown to black, consolidated oil-bearing shale; strongly acid.

The depth to weathered shale ranges from 6 to 18 inches. In some areas glacial pebbles are scattered on the surface.

Colyer soils contain a small amount of organic matter and are low in natural fertility. They have rapid to very rapid surface runoff and slow to moderate permeability. The penetration of roots is restricted by the shale.

Colyer soils, 12 to 25 percent slopes (CoE).—These soils have, in most places, a friable silt loam surface layer that is underlain by mixed weathered shale and yellowish-brown soil material. The surface layer is generally 6 to 9 inches thick. In a few small areas it is thinner, and shale fragments are on the surface. Surface runoff is rapid. Erosion, low moisture-supplying capacity and the shallow depth to shale are the main problems of management. Much of the acreage is in trees, probably the best use. (Capability unit VIIe–3.)

Colyer soils, 25 to 60 percent slopes (CoF).—The profile described for the Colyer series was in an area of these soils that has a silt loam surface soil. Most of the surface layer of these soils has washed away. The partly weathered shale is at depths of less than 20 inches. Shale outcrops are numerous, and fragments of shale are scattered on the surface. These soils have very rapid surface runoff. They are mostly in woods and are best for that use. Trees grow better on the north-facing than on south-facing slopes because less moisture is lost through evaporation. (Capability unit VIIe–3.)

Dubois Series

The Dubois series consists of moderately deep to deep, imperfectly drained, medium-textured soils on terraces. These soils are nearly level to gently sloping. Most of the acreage is in an area of about 3 square miles that is southeast of Scottsburg and west of Pigeon Roost Creek. This area is on low terraces called second bottoms. The Dubois soils developed in mixed alluvial materials washed from the higher lying soils that formed in material weathered from loess, sandstone, shale, and Illinoian glacial till. The native vegetation was trees.

These soils have a dark grayish-brown to brown surface layer. The subsoil is yellowish-brown silt loam to silty clay loam mottled with gray. A compact pan is in the lower part of the subsoil.

The Dubois soils in this county have a total acreage of about 4 square miles. They are somewhat similar to the imperfectly drained Avonburg soils but are in different positions than those soils and have different kinds of parent materials. The Dubois soils are in alluvial materials on second bottoms, whereas the Avonburg soils are on the higher till plain underlain by glacial till material. Both soils developed in a thin layer of loess.

Representative profile (Dubois silt loam, 0 to 2 percent slopes, in NW¼SE¼ sec. 20, T. 3 N., R. 7 E.):

A_0 ½ to 0 inch, partly decomposed grasses, leaves, and twigs.

A_1 0 to 2 inches, dark grayish-brown (10YR 4/2, moist) silt loam; weak, fine, granular structure; friable when moist; strongly acid; 1 to 3 inches thick; boundary abrupt and smooth.

A_2 2 to 7 inches, dark-brown (10YR 4/3, moist) silt loam; moderate, thin, platy structure and moderate, medium, granular structure; friable when moist; strongly acid; 4 to 6 inches thick; boundary abrupt and smooth.

A_3 7 to 9 inches, brown (10YR 5/3, moist) silt loam; moderate, medium, granular structure; friable when moist; strongly acid; 1 to 2 inches thick; boundary abrupt and smooth.

B_1 9 to 13 inches, brown (10YR 5/3, moist) silt loam mottled with yellowish brown (10YR 5/4, moist); mottles are common, fine, and faint; weak, fine to medium, subangular blocky structure; friable when moist; strongly acid; 3 to 6 inches thick; boundary gradual and wavy.

B_{21} 13 to 21 inches, light yellowish-brown (10YR 6/4, moist) silt loam mottled with yellowish brown (10YR 5/4, moist); mottles are many, medium, and faint; weak, medium, platy structure and weak, fine to medium, subangular blocky structure; friable when moist; strongly acid; 4 to 9 inches thick; boundary gradual and irregular.

B_{22m} 21 to 34 inches, yellowish-brown (10YR 5/8, moist) silty clay loam mottled with gray (10YR 6/1, moist); pale-brown (10YR 6/3, moist) coatings of silt; mottles are many, medium, and distinct; prismatic structure breaking into weak, medium to coarse, subangular blocky and angular blocky structure; firm when moist; strongly acid; 12 to 15 inches thick; boundary gradual and irregular.

B_{23m} 34 to 41 inches, brownish-yellow to yellowish-brown (10YR 6/6 to 5/8, moist) silty clay loam mottled with pale brown (10YR 6/3, moist); mottles are many, medium, and distinct; massive (structureless); firm when moist and slightly sticky when wet; strongly acid; 5 to 10 inches thick; boundary gradual and irregular.

B_3 41 to 72 inches, yellowish-brown (10YR 5/6, moist) silty clay loam mottled with gray (10YR 6/1, moist); mottles are common, coarse, and distinct; layer streaked with many brown concretions; very weak, medium, angular blocky structure; firm when moist and slightly sticky when wet; medium acid; 24 to 36 inches thick.

D 72 inches +, yellowish-brown (10YR 5/4 to 5/8, moist), stratified silt, silty clay loam, fine sand, and sand blotched with light gray (2.5Y 7/2, moist); massive (structureless); firm when moist; neutral.

The Dubois soils have a surface soil that varies in texture according to the texture of the loess or alluvium in which they developed. In a few areas on high bottoms the Dubois soils are sandier and shallower than they are on more prominent terraces. Concretions of iron and manganese are at depths below 40 inches, and they vary in amount from place to place.

Dubois soils have a compact fragipan at depths of 20 to 40 inches. The subsoil is slowly permeable. Wetness and low natural fertility are the main problems of management. If they have not been limed, these soils are strongly acid in the upper part of the profile. They may be neutral at depths of 5 to 8 feet or more.

Dubois silt loam, 0 to 2 percent slopes (DbA).—This soil has a profile like the one described for the series. A fragipan is at depths of 20 to 28 inches. Surface runoff is slow, and this soil needs to be drained by tile lines or ditches. If drained, it is well suited to row crops in a cropping system that includes a small grain and meadow. The row crops can be grown for as many as 3 consecutive years. (Capability unit IIw-1.)

Dubois silt loam, 2 to 6 percent slopes (DbB).—This soil adjoins soils on bottom lands in many areas. It has slow to medium surface runoff and needs to be drained. It is more sloping than Dubois silt loam, 0 to 2 percent slopes, and more susceptible to erosion. To provide drainage and protect against erosion, dig ditches across the slopes and grass the waterways. This soil is suited to row crops in a cropping system that includes a small grain and meadow. (Capability unit IIw-1.)

Dubois silt loam, 2 to 6 percent slopes, moderately eroded (DbB2).—This soil has lost through sheet erosion all except 5 or 6 inches of its original surface layers (A horizon). To protect it against this erosion, provide grassed waterways to carry away excess water and plant winter cover crops. Leave crop residue on the soil after the crops have been harvested. This soil can be used for row crops if they are grown in a cropping system that includes a small grain and meadow. If row crops are grown as much as 2 consecutive years, till on the contour and include deep-rooted legumes in the cropping system. (Capability unit IIw-1.)

Grayford Series

The Grayford series consists of deep, well-drained, medium-textured soils on uplands. These soils are gently sloping to steep and occur in the east-central part of the county. They developed in deposits of loess less than 24 inches thick. The loess is underlain by Illinoian till and the till, in turn, by limestone residuum. This residuum is at depths of less than 5 feet. These soils formed under forest vegetation.

The brown to dark-brown silt loam surface layers (A horizon) are 3 to 12 inches thick. The subsoil is dark-brown to reddish-brown silty clay loam to silty clay.

The Grayford soils in this county have a total area of less than 1 square mile. They occur with the Cincinnati and Haymond soils. They are slightly redder than the Cincinnati soils and contain more clay in the lower part of the subsoil. Grayford soils do not have a calcareous layer in the till parent material like that in the Cincinnati soils.

Representative profile (Grayford silt loam, 12 to 18 percent slopes, moderately eroded, east of a road in NW¼NW¼SE¼ sec. 25, T. 3 N., R. 8 E.):

A_1 0 to 3 inches, dark-brown (10YR 3/3, moist) silt loam; weak, fine, granular structure; friable when moist and slightly sticky when wet; mildly alkaline; 3 to 6 inches thick; boundary abrupt and smooth.

A_2 3 to 7 inches, dark yellowish-brown (10YR 3/4, moist) silt loam; weak, medium, granular structure; friable when moist and slightly sticky when wet; neutral; 3 to 5 inches thick; boundary abrupt and smooth.

B_1 7 to 15 inches, dark-brown (7.5YR 4/4, moist) light silty clay loam; weak, fine, subangular blocky structure; friable when moist and slightly sticky when wet; neutral; 6 to 9 inches thick; boundary clear and wavy.

B_{21} 15 to 28 inches, dark-brown (7.5YR 4/4, moist) silty clay loam; moderate, medium, subangular blocky structure; firm when moist and sticky when wet; medium acid; 12 to 14 inches thick; boundary clear and wavy.

B_{22} 28 to 38 inches, dark brown (7.5YR 4/4, moist) or very dark brown (10YR 2/2, moist) silty clay loam; moderate, medium, subangular blocky structure; firm when moist and very sticky when wet; medium acid; 8 to 12 inches thick; boundary clear and smooth.

B_{23} 38 to 74 inches, dark brown (7.5YR 4/4 moist) and very dark brown (10YR 2/2, moist) silty clay; strong, medium to coarse, subangular blocky structure; firm when moist and very sticky when wet; very strongly acid; 24 to 36 inches thick; boundary abrupt and smooth.

D_r 74 inches +, limestone bedrock.

In some places the mantle of loess in which these soils developed is 20 inches deep; in other places it is missing. Bedrock is at depths of 4 to 8 feet. In the deeper areas, the subsoil is more friable and contains more glacial pebbles and less clay than in the shallower areas.

Included in the mapping units of Grayford soils are areas of Corydon soils that total about 18 acres. In these inclusions, the soil is less than 26 inches deep to bedrock, and in some places there are outcrops of limestone. The surface soil is dark brown, and the subsoil is reddish brown or dark reddish brown. The Corydon soils are not mapped separately in Scott County.

If they have not been limed, the Grayford soils are acid except for a few inches above the bedrock. Here, the soil material is neutral to slightly acid.

Grayford silt loam, 2 to 6 percent slopes (GaB).—This soil has surface layers (A horizon) that are 8 to 12 inches thick. In other respects its profile is somewhat similar to the one described for the series. Surface runoff is slow,

but erosion is a hazard in cleared areas. This soil is suited to row crops, but it needs protection from erosion. Divert water from higher lying soils, plow on the contour, and stripcrop the more sloping areas. (Capability unit IIe-1.)

Grayford silt loam, 2 to 6 percent slopes, moderately eroded (GaB2).—The surface layers (A horizon) are less than 8 inches thick. Much of the material in the original surface soil has washed away. In places part of the subsoil has been mixed with the original surface soil by tillage. Surface runoff is slow, but erosion is a hazard. If protected from erosion by terracing and stripcropping, this soil is suited to row crops. Keep crop residue on this soil, and plow it under before another crop is planted. (Capability unit IIe-1.)

Grayford silt loam, 6 to 12 percent slopes, moderately eroded (GaC2).—This soil has retained only 3 to 8 inches of the material in its original surface layers (A horizon). The rest has washed away. In some places limestone crops out. In most areas the surface layer is a mixture of the original surface soil and the subsoil. Surface runoff is medium, and erosion is a problem. This soil is best suited to small grains and meadow. If row crops are planted, this soil must be managed carefully to control erosion. (Capability unit IIIe-1.)

Grayford silt loam, 12 to 18 percent slopes, moderately eroded (GaD2).—This soil has a profile like the one described for the series. Only 3 to 8 inches of the original surface layer remains. The subsoil and remaining surface soil have been mixed by tillage, and the surface layer is now lighter in color than it used to be. Surface runoff is rapid, and erosion is a hazard. The best use for this soil is permanent pasture or meadow. (Capability unit IVe-2.)

Grayford silt loam, 18 to 25 percent slopes (GaE).—Most of this soil is in woods, and for that reason, little of the surface layers has washed away. The surface layers (A horizon) are 7 to 10 inches thick. If the timber is removed, this soil is susceptible to erosion. Areas that are not wooded should be kept in pasture. (Capability unit VIe-2.)

Grayford silt loam, 18 to 35 percent slopes, moderately eroded (GaE2).—Much of the material in the surface layers of this soil has washed away. Only 3 to 7 inches of the original surface layers (A horizon) remains. Surface runoff is very rapid, and erosion is a hazard. Keep this soil in permanent pasture or trees. Christmas trees can be grown. (Capability unit VIe-2.)

Grayford silt loam, 25 to 35 percent slopes (GaF).—Because this steep soil has been left in woods, most of the original surface layers remain. Keep this soil in woods, which is its best use. (Capability unit VIIe-3.)

Grayford soils, 6 to 12 percent slopes, severely eroded (GfC3).—These soils are so severely eroded that less than 3 inches of the material in the original surface layers (A horizon) remains. This material has been mixed with the subsoil by tillage, and the surface layers are lighter colored than those described for the series. Erosion must be controlled if the soils are to be productive. These soils are probably best suited to permanent pasture, small grains, or meadow. Row crops can be grown once in a cropping system that keeps the soils in meadow for 3 years. (Capability unit IVe-1.)

Grayford soils, 12 to 18 percent slopes, severely eroded (GfD3).—Most of the material in the original surface layers (A horizon) of these soils has washed away. Less than 3 inches remains. Surface runoff is rapid, and erosion is severe. The best use for these soils is permanent pasture or trees. In some areas pine Christmas trees grow well. (Capability unit VIe-1.)

Gullied Land

This miscellaneous land type consists of deeply gullied land and areas that were formerly gullied but that have now been reclaimed. The soil material on this land ranges from gravel to silt. Where the substratum is exposed, erosion is very difficult to control.

This land is not suited to pasture. Plant trees or seed to grass, but do not allow cattle to graze. Special protection is needed in areas where gullies have cut into good cropland or have endangered farm buildings. Here, the farmer can reshape banks or change the gradients of slopes, or he can build structures to control the gullies. Your county agent or local representative of the Soil Conservation Service will help you decide the management needed.

Gullied land, acid shale materials (Gg).—This land occurs mainly in the eastern and southwestern parts of the county. In the eastern part, it occurs with the Cana, Jennings, and Trappist soils. In the western part, it occurs with the Zanesville soils. All of the original surface soil and most of the subsoil have washed away. Dark-brown to black, acid shale is at depths of 12 to 60 inches. In many places this shale is exposed. Little vegetation is on this land, except where it is planted to trees. These areas do not reseed naturally, but if pines are planted, they form a good ground cover. (Capability unit VIIe-2.)

Gullied land, neutral shale materials (Gm).—This land occurs mainly in the south-central part of the county. All of the material in the original surface soil and most of the subsoil have washed away. Neutral, grayish-green shale is at depths of less than 48 inches. In most places this shale is exposed. Vegetation is sparse and difficult to establish. Pine trees should be planted to help prevent further gullying. (Capability unit VIIe-2.)

Gullied land, glacial materials (Gr).—This land occurs mainly in the northern part of the county. It occurs with the Rossmoyne, Cincinnati, Parke, and Grayford soils. All of the original surface soil and most of the subsoil have washed away. In most areas many pebbles from glacial till, boulders, and angular stones are on the surface. Vegetation is difficult to establish in these areas. Pine trees should be planted to help prevent further gullying. (Capability unit VIIe-2.)

Haubstadt Series

The Haubstadt series consists of deep, moderately well drained, medium-textured soils on terraces. These soils are gently sloping and occur between soils on bottom lands and those on uplands. The Haubstadt soils are in the north-central, central, and south-central parts of the county. They developed in a thin mantle of loess, which is underlain by a mixture of lacustrine or alluvial materials of Illinoian age. These underlying materials washed from soils that formed in loess and weathered sandstone, shale, and glacial till. The native vegetation was trees.

These soils have dark grayish-brown to yellowish-brown surface layers (A horizon) that are not more than

12 inches thick. Their subsoil is yellowish brown and is mottled below about 18 inches with gray and light brownish gray. In some places the subsoil has a weak fragipan in the lower part.

The Haubstadt soils in this county have a total area of about 2 square miles. In most places they occur with the well-drained Otwell and the imperfectly drained Dubois soils. The Haubstadt soils are somewhat similar to the Rossmoyne soils but are slightly darker in color and are more acid in reaction. They are underlain by mixed stratified materials, whereas the Rossmoyne soils are underlain by glacial till.

Representative profile (Haubstadt silt loam, 2 to 6 percent slopes, 1,000 feet north of highway and east of road in SW¼NW¼NE¼ sec. 19, T. 3 N., R. 8 E.):

A_0 ½ to 0 inch, loose, partly decomposed leaf and twig litter and moss.

A_1 0 to 4 inches, very dark grayish-brown (10YR 3/2, moist) silt loam; moderate to strong, very fine, granular structure; friable when moist; neutral; 1 to 4 inches thick; boundary abrupt and smooth.

A_2 4 to 11 inches, dark grayish-brown (10YR 4/2, moist) silt loam; strong, thin, platy structure; friable when moist; strongly acid; 4 to 7 inches thick; boundary abrupt and smooth.

B_1 11 to 15 inches, yellowish-brown (10YR 5/4, moist) silt loam; weak, fine to medium, subangular blocky structure; friable when moist; strongly acid; 3 to 6 inches thick; boundary clear and wavy.

B_{21} 15 to 25 inches, yellowish-brown (10YR 5/6, moist) silt loam; moderate, fine to medium, subangular blocky structure; firm when moist; strongly acid; 8 to 11 inches thick; boundary clear and smooth.

B_{22} 25 to 31 inches, yellowish-brown (10YR 5/6, moist) silt loam mottled with light brownish gray (10YR 6/2, moist); mottles are common, medium, and distinct; moderate, fine to medium, subangular blocky structure; firm when moist and slightly sticky when wet; strongly acid; 5 to 7 inches thick; boundary clear and wavy.

B_{23m} 31 to 43 inches, light yellowish-brown (10YR 6/4, moist) silty clay loam mottled with light gray (10YR 6/1, moist); mottles are many, medium, and distinct; moderate, coarse, prismatic, or polygonal, structure; very firm when moist and sticky when wet; strongly acid; 10 to 15 inches thick; boundary diffuse and wavy.

B_3 43 to 91 inches, light yellowish-brown (10YR 6/4, moist) silty clay loam mottled with yellowish brown (10YR 5/8 moist); cracks filled with light-gray (10YR 6/1, moist) silt; mottles are common, medium, and distinct; weak, coarse, prismatic structure which breaks into weak, coarse, subangular blocky; very firm when moist and very sticky when wet; strongly acid; lower boundary diffuse and irregular.

D 91 inches +, strongly acid, stratified sand, silt, and clay.

The surface layers (A horizon) are 2 to 12 inches thick. Mottling is at depths of 15 to 30 inches. In most places the subsoil has a weak fragipan at depths of 28 to 36 inches. This pan varies in thickness and degree of compaction. Stratified sediments of sand, silt, and silty clay loam occur below 5 to 8 feet.

If they have not been limed, most of the Haubstadt soils are strongly acid. In some places, however, the underlying material is neutral in reaction. The natural fertility and the content of organic matter are low. Permeability is slow to moderate.

Haubstadt silt loam, 2 to 6 percent slopes (HaB).—This soil has a profile like the one described for the series. The surface layers (A horizon) are dark grayish-brown to brown silt loam, 8 to 12 inches thick. Surface runoff is slow to medium, and in cultivated areas, erosion is a hazard. Row crops are suited and can be grown 2 years in succession if this soil is stripcropped and plowed on the contour. (Capability unit IIe-1.)

Haubstadt silt loam, 2 to 6 percent slopes, moderately eroded (HaB2).—The surface layers (A horizon) of this soil are only 3 to 8 inches thick because much of the material in the original surface layers has washed away. The subsoil has been mixed with the remaining surface soil by tillage, and the surface soil is lighter colored than it used to be. This soil is suited to row crops in a rotation that includes a small grain and meadow. To help prevent erosion, stripcrop and plow on the contour. (Capability unit IIe-1.)

Haubstadt soils, 2 to 6 percent slopes, severely eroded (HbB3).—Most of the material in the surface layers (A horizon) of this soil has washed away; less than 3 inches remains. In most places the yellowish-brown subsoil makes up most of the plow layer. Tilth is poor, and additional organic matter is needed. Row crops are suited, but these should be planted in a rotation that includes a small grain and 3 years of meadow. Grass the waterways so that excess water is carried away safely. (Capability unit IVe-1.)

Haymond Series

The Haymond series consists of deep, well-drained, medium-textured soils on bottom lands. These soils have a dark-brown to very dark-brown surface layer that is underlain by dark-brown to yellowish-brown soil material. The soils are nearly level to gently sloping and occur along streams in the southwestern, south-central, and eastern parts of the county. They are developing in mixed materials that washed from soils on uplands and terraces that contain sufficient limy material to neutralize the soil acidity. The native vegetation was trees.

The Haymond soils in this county have a total area of about 3 square miles. They occur with the Wilbur soils in positions bordering stream channels. Because they are on slightly coarser textured, more permeable materials, they are better drained than the Wilbur soils. Haymond soils differ from the Pope soils mainly in reaction. They are medium acid to neutral, whereas the Pope soils are medium acid to strongly acid.

Representative profile (Haymond silt loam, 0 to 2 percent slopes, 156 feet west of northwest corner of bridge in SW¼NE¼ sec. 25, T. 3 N., R. 8 E.):

A_p 0 to 10 inches, very dark brown (10YR 2/2, moist) silt loam; weak, medium, granular structure; friable when moist; neutral; 10 to 14 inches thick; boundary clear and smooth.

C_1 10 to 18 inches, very dark grayish-brown (10YR 3/2, moist) silt loam; weak, medium, granular structure; friable when moist; neutral; 6 to 9 inches thick; boundary gradual.

C_2 18 to 30 inches +, dark yellowish-brown (10YR 4/4, moist) silt loam with a few strata of fine sandy loam and loam; weak, fine, granular structure; slightly acid.

In most places the Haymond soils have a silt loam surface soil, but in a few small areas the surface soil is fine sandy loam. Stratified layers of sand, silt, and gravel are at depths of 25 to 60 inches. Most of the Haymond soils in this county are neutral in reaction, but those on second bottoms are medium acid. The Haymond soils have moderate permeability and are very productive.

Haymond silt loam, 0 to 2 percent slopes (HdA).—This soil has a profile similar to the one described for

the series. It is occasionally flooded but drains quickly after floods. Flooding, therefore, is not so serious as it would be if this soil drained slowly. Row crops are best suited, but a mixture of legumes and grasses should be planted every third or fourth year. Small grains may be damaged by overflow. Included with this soil along streams are a few areas that have shallower soil material than that described. (Capability unit I–2.)

Haymond silt loam, 2 to 6 percent slopes (HdB).—This soil normally occurs adjacent to streams and bayous. In some areas, a layer of sandy loam is within 18 inches of the surface. Other small areas have a surface layer of fine sandy loam. This soil is best suited to row crops grown for 2 or 3 years in a cropping system with a grass-legume mixture. (Capability unit I–2.)

Haymond silt loam, high bottom, 0 to 2 percent slopes (HhA).—This soil occurs in the southwestern and eastern parts of the county. It is not susceptible to overflow. It is deeper to stratified material than the Haymond silt loams in lower positions and contains more clay in the subsoil than those soils. A systematic cropping system that includes fall-seeded small grains may be used.

Representative profile in SW¼NE¼ sec. 25, T. 3 N., R. 8 E.:

A_p 0 to 10 inches, dark yellowish-brown (10YR 4/4, moist) silt loam; weak, fine, granular structure; sticky when wet; medium acid; 6 to 12 inches thick; boundary clear and wavy.

B_1 10 to 18 inches, yellowish-brown (10YR 5/6, moist) silt loam; weak, fine, granular structure; sticky when wet; medium acid; 6 to 15 inches thick; boundary gradual and wavy.

B_2 18 to 36 inches, dark-brown (10YR 4/3, moist) and grayish-brown (10YR 5/2, moist) light silty clay loam; moderate, fine, granular structure; sticky when wet; medium acid; 15 to 24 inches thick.

C 36 inches +, yellowish-brown (10YR 5/4, moist), stratified silt and clay and thin layers of sand and gravel; medium acid.

Included with this soil are a few areas that have a fine sandy loam surface layer.

Haymond silt loam, high bottom, 0 to 2 percent slopes, is well suited to row crops. The row crops, however, should be grown in a cropping system that provides a grass-legume mixture every third or fourth year. (Capability unit I–2.)

Haymond silt loam, high bottom, 2 to 6 percent slopes (HhB).—This soil is more sloping than Haymond silt loam, high bottom, 0 to 2 percent slopes, and is slightly thinner in the surface layers (A horizon). It is susceptible to slight erosion. This soil is suited to row crops. To help control erosion, leave crop residue on the soil and plant cover crops. (Capability unit I–2.)

Jennings Series

The Jennings series consists of deep, well-drained, medium-textured soils on uplands. These soils are gently sloping to steep and occur mostly in the north-central and eastern parts of the county. They developed in silty loess that extends to depths of 12 to 30 inches. The loess is underlain by leached, Illinoian glacial till, and the till, in turn, is underlain by weathered shale. This shale, locally called black shale or "slate", is at depths of 40 to 72 inches. The native vegetation was trees.

These soils have a brown to yellowish-brown silt loam surface layer that ranges from less than 3 inches to as much as 12 inches in thickness. The subsoil is yellowish-brown to dark yellowish-brown silt loam to silty clay loam.

The Jennings soils in this county have a total area of about 19 square miles. In many places they adjoin the moderately well drained Cana soils. They are similar to the Cana soils in color and texture. The Jennings soils are similar to the well-drained Cincinnati soils in the upper part of the profile, but the lower part of the Jennings profile contains more shale fragments. The Cincinnati soils are deeper to shale than the Jennings soils.

Representative profile (Jennings silt loam, 6 to 12 percent slopes, west of a county road in NW¼NW¼ sec. 32, T. 3 N., R. 8 E.):

A_p 0 to 10 inches, brown (10YR 4/3, moist) silt loam; weak, fine, granular structure; friable when moist; slightly acid; 10 to 12 inches thick; boundary clear.

B_1 10 to 16 inches, dark yellowish-brown (10YR 4/4, moist) silt loam; moderate, medium, subangular blocky structure; friable when moist; medium acid; 4 to 5 inches thick; boundary clear and wavy.

B_{21} 16 to 26 inches, yellowish-brown (10YR 5/4, moist) silt loam; moderate, medium, subangular blocky structure; firm when moist; strongly acid; 10 to 12 inches thick; boundary clear and wavy.

B_{22} 26 to 36 inches, yellowish-brown (10YR 5/6, moist) silt loam to silty clay loam; moderate, coarse, subangular blocky structure; firm when moist; strongly acid; 10 to 12 inches thick; boundary clear and wavy.

B_{23m} 36 to 42 inches, brownish-yellow (10YR 6/6, moist) silt loam; weak, medium, prismatic breaking to strong, coarse, subangular blocky structure; very firm fragipan when moist; strongly acid; 6 to 8 inches thick; boundary abrupt and wavy.

D_r 42 inches +, dark-brown to black, very strongly acid shale.

The loess in which these soils developed is as much as 30 inches thick in some places. In other places there is little loess, and the soil has developed largely in the Illinoian glacial till. Pebbles from the glacial till and fragments of shale vary in number from place to place.

If they have not been limed, the Jennings soils are acid. They are low in natural fertility and organic matter, but they respond well to amendments. Permeability is moderate, and surface runoff is medium to very rapid.

Jennings silt loam, 2 to 6 percent slopes (JmB).—This soil has a very dark grayish-brown to brown surface layer, 10 to 12 inches thick. Surface runoff is medium, and in cultivated areas, erosion is a hazard. Row crops can be grown for 2 years in 5 in a cropping system that provides stripcropping and terracing. (Capability unit IIe–1.)

Jennings silt loam, 2 to 6 percent slopes, moderately eroded (JmB2).—Much of the original surface layer of this soil has washed away. Only 3 to 9 inches remains. In places, part of the lighter colored subsoil has been mixed with the remaining surface layer by tillage. This soil is suited to row crops, but to prevent erosion, it needs to be tilled on the contour. Carry away excess water in grassed waterways. (Capability unit IIe–1.)

Jennings silt loam, 6 to 12 percent slopes (JmC).—This soil has a profile like the one described for the series. Its friable, brown surface layer is silt loam, 9 to 12 inches thick. Surface runoff is medium. Most of the acreage is in woods or permanent pasture. Cleared areas need management that controls erosion. This soil is suited to row crops if it is stripcropped and terraced. The row

crops should be grown in a cropping system that includes a small grain and meadow. (Capability unit IIIe–1.)

Jennings silt loam, 6 to 12 percent slopes, moderately eroded (JmC2).—All except 3 to 9 inches of the original brown surface layer of this soil has washed away. The lighter colored subsoil has been mixed with the remaining surface soil by tillage. Some areas of this soil are in pasture and woods, which are probably its best uses. If cleared areas are stripcropped and terraced, they are suited to row crops. The row crops should be grown in a cropping system that includes a small grain and meadow. (Capability unit IIIe–1.)

Jennings silt loam, 12 to 18 percent slopes (JmD).—This soil has a profile similar to the one described for the series. Its brown surface layer is 9 to 12 inches thick. Most of this soil is in wooded areas that are protected against erosion. If the trees are removed for cultivation, erosion must be controlled. The best use for cleared areas is probably hay or pasture. Grain can be grown in a cropping system that provides 3 years of meadow. (Capability unit IVe–2.)

Jennings silt loam, 12 to 18 percent slopes, moderately eroded (JmD2).—Much of the surface layer of this soil has washed away. Only 3 to 9 inches of the original surface layer remains. The present surface layer is a mixture of the original surface soil and the lighter colored subsoil. Surface runoff is rapid, and erosion is the main problem. This soil should be kept in hay or pasture, but grain can be grown in a long cropping system. (Capability unit IVe–2.)

Jennings soils, 2 to 6 percent slopes, severely eroded (JnB3).—Most of the original surface layer of these soils has washed away. The remaining surface layer is less than 3 inches thick, and the plow layer is mostly in the upper part of the subsoil. Tilth is poor, and the soils need additional organic matter. The best use for these soils is probably permanent pasture, meadow, or pine Christmas trees. (Capability unit IVe–1.)

Jennings soils, 6 to 12 percent slopes, severely eroded (JnC3).—In most places the original surface layer of these soils is less than 3 inches thick. The rest has washed away. The plow layer is mainly in the upper part of the subsoil. These soils contain small amounts of plant nutrients and organic matter. They are best suited to permanent pasture, meadow, or pine Christmas trees. (Capability unit IVe–1.)

Jennings soils, 12 to 18 percent slopes, severely eroded (JnD3).—These soils have less than 3 inches of the original surface layer in most places. The plow layer consists mainly of subsoil material. If a thick permanent cover is not maintained, surface runoff is rapid to very rapid and the soils erode quickly. Plant these soils to permanent meadow, pasture, or trees. (Capability unit VIe–1.)

Jennings silt loam, heavy substratum, 2 to 6 percent slopes (JhB).—This soil occurs mainly in wooded areas on narrow ridgetops. Its surface layers (A horizon) are 8 to 12 inches thick. It has a finer textured subsoil and substratum than Jennings silt loam, 6 to 12 percent slopes, has a stronger, more blocky structure, is more acid, and is less permeable to moisture and roots.

Representative profile, (Jennings silt loam with a heavy substratum, north of road in NW¼NW¼ sec. 14, T. 2 N., R. 6 E.):

A_0 ½ to 0 inch, loose, undecomposed leaf and twig litter from deciduous trees and bushes.

A_1 0 to 3 inches, yellowish-brown (10YR 5/4, moist) silt loam; weak, fine, granular structure; friable when moist; very strongly acid; 3 to 4 inches thick; boundary abrupt and smooth.

A_2 3 to 8 inches, yellowish-brown (10YR 5/6 to 5/8, moist) silt loam; weak, thin, platy structure, friable when moist; very strongly acid; 3 to 6 inches thick; boundary clear and wavy.

B_1 8 to 21 inches, strong-brown (7.5YR 5/6, moist) heavy silt loam; moderate, fine, subangular blocky structure; friable when moist; very strongly acid; 12 to 15 inches thick; boundary clear and wavy.

B_{21} 21 to 33 inches, yellowish-brown (10YR 5/6, moist) and yellowish-red (5YR 5/6, moist), coarse silt loam to light silty clay loam; moderate, medium, subangular blocky structure; friable to firm when moist; few roots; peds covered with distinct clay skins, strong brown (7.5YR 5/6, moist) in color; many till pebbles; a few fragments of shale 2 to 4 millimeters thick; very strongly acid; 10 to 14 inches thick; boundary clear and wavy.

B_{22} 33 to 43 inches, light brownish-gray (10YR 6/2, moist) and strong-brown (7.5YR 5/6, moist) silty clay loam; moderate, coarse, subangular blocky structure; firm when moist; few roots; a few pebbles 1 to 3 millimeters in diameter; many fragments of shale ½ to 3 inches across; very strongly acid; 9 to 11 inches thick; boundary clear and wavy.

B_{23} 43 to 49 inches, light brownish-gray (2.5Y 6/2, moist) to brown (7.5YR 5/4, moist) and yellowish-red (5YR 4/8, moist) silty clay; moderate, fine, subangular blocky structure; firm when moist; few roots in main cleavage openings; peds have thin, faint, yellowish-brown (10YR 5/4, moist) clay skins; very strongly acid; 5 to 6 inches thick; boundary abrupt and wavy.

B_{24} 49 to 65 inches, red (2.5YR 4/6, moist) and pale-red (2.5YR 6/2, moist) clay; strong, coarse, angular blocky structure; very firm when moist; peds have thin, faint, brown (10YR 5/3, moist) clay skins that gradually fade as depth increases; strongly acid in upper part to slightly acid in lower part; 15 to 17 inches thick; boundary abrupt and wavy.

D_r 65 inches +, olive (5Y 5/3, moist), neutral, grayish-green shale; very coarse, angular blocky structure that breaks to platy when dry; spaces between shale fragments, in places, have thin, brown (10YR 5/3, moist) clay flows; neutral.

Below depths of about 24 inches (in the B_{21}, B_{22}, B_{23}, and B_{24} horizons), the soil material contains many pebbles from the glacial till, and the amount of hard, black shale fragments increases with increasing depth. Grayish-green, partly weathered, soft clay shale occurs at depths of 38 to 70 inches. This soil can be used for row crops in a cropping system that includes a small grain and meadow. If the soil is stripcropped and terraced, the row crops can be grown for 2 consecutive years in a 5-year cropping system. (Capability unit IIe-1.)

Jennings silt loam, heavy substratum, 2 to 6 percent slopes, moderately eroded (JhB2).—Much material has washed from the upper layers of this soil. The present surface layers (A horizon) are less than 8 inches thick. In places the subsoil has been mixed with the remaining surface soil by tillage. On the surface are pebbles from glacial till. Surface runoff is medium, and grassed waterways are needed to carry away excess water. This soil is suited to row crops in a cropping system that provides small grain and meadow. (Capability unit IIe-1.)

Jennings silt loam, heavy substratum, 6 to 12 percent slopes (JhC).—This soil occurs mainly in wooded areas, and little of its surface layer has washed away. The surface layers (A horizon) are 8 to 12 inches thick. Surface runoff is medium, and in cleared areas erosion is a hazard. This soil is suited to row crops in a cropping system that includes small grain and meadow. The row crops should

not be grown more than once in 5 years. (Capability unit IIIe-1.)

Jennings silt loam, heavy substratum, 6 to 12 percent slopes, moderately eroded (JhC2).—This soil has had all except 3 to 8 inches of the original surface layers (A horizon) washed away. In some places a few yellowish-red, galled spots occur where the subsoil is exposed. Surface runoff is medium, and erosion is a problem. Improve tilth by returning plant residue to the soil. This soil is in permanent pasture, crops, and grazed woodland. Small grain and meadow are suited. (Capability unit IIIe-1.)

Jennings silt loam, heavy substratum, 12 to 18 percent slopes (JhD).—Because it is mostly in woods, this soil has been protected from erosion. Its surface layers (A horizon) are 8 to 10 inches thick. Surface runoff is medium to rapid, and in cleared areas erosion is a hazard. If cleared of trees, this soil should be limed, fertilized, and seeded to mixtures of grasses and legumes for pasture. (Capability unit IVe-2.)

Jennings silt loam, heavy substratum, 12 to 18 percent slopes, moderately eroded (JhD2).—Much of the material in the original surface layers (A horizon) of this soil has washed away; only 3 to 8 inches remains. In places the yellowish-red subsoil is exposed. Surface runoff is medium in areas where vegetation is thick and is rapid in areas where vegetation is sparse. Erosion is the main problem. Areas from which water is not diverted should be kept in permanent vegetation. Improved pasture sown to mixtures of grasses and legumes is well suited. (Capability unit IVe-2.)

Jennings silt loam, heavy substratum, 18 to 25 percent slopes (JhE).—Most of this soil is in woods, which is its best use. Surface runoff is rapid, and if the trees are removed, erosion must be controlled. (Capability unit VIe-2.)

Jennings silt loam, heavy substratum, 25 to 35 percent slopes (JhF).—This soil is mostly in woods and is best suited to that use. Its surface layers (A horizon) are about 8 inches thick. Soil formation about equals soil loss. Surface runoff is rapid to very rapid, and permeability is slow to moderate. Erosion is a hazard. (Capability unit VIIe-3.)

Jennings soils, heavy substratum, 6 to 12 percent slopes, severely eroded (JkC3).—Most of the material in the surface layers (A horizon) of these soils has washed away; less than 3 inches remains. The plow layer consists mostly of yellowish-red subsoil material. In places, gullies have cut through the subsoil and have exposed light brownish-gray soil material that has weathered from the underlying grayish-green shale. Surface runoff is medium to rapid, and erosion is severe. Terraces are needed to divert water from higher lying areas. It is probably best to keep these soils in permanent pasture, meadow, or pine Christmas trees. (Capability unit IVe-1.)

Jennings soils, heavy substratum, 12 to 18 percent slopes, severely eroded (JkD3).—Most of the material in the original surface layers (A horizon) of these soils has washed away; less than 3 inches remains. The plow layer is a mixture of the remaining surface soil and the yellowish-red subsoil. In places, gullies have penetrated the subsoil and have exposed light brownish-gray soil material that has weathered from the underlying grayish-green shale. Surface runoff is rapid, and erosion is severe. The soils are best suited to trees, permanent meadow, or pasture. Some areas are suited to pine Christmas trees. (Capability unit VIe-1.)

Jennings soils, heavy substratum, 18 to 25 percent slopes, severely eroded (JkE3).—These soils have lost nearly all of the material in their original surface layers (A horizon), and the yellowish-red subsoil is exposed in places. In many areas, gullies have penetrated the subsoil and have exposed the underlying grayish-green shale. The original yellowish-brown surface soil between these gullies ranges from 1 inch to 7 inches in thickness. Surface runoff is rapid on these soils. They should be kept in woods. (Capability unit VIIe-2.)

Jennings silt loam, mixed substratum, 6 to 12 percent slopes (JeC).—This soil occurs mainly in wooded areas where it has been protected from erosion. It has dark-brown surface layers (A horizon), about 8 to 12 inches thick. The subsoil is yellowish brown in the upper part and reddish brown in the lower part. This soil has a different kind of substratum than Jennings silt loam, 6 to 12 percent slopes, which is underlain by shale. This soil is underlain by glacial till mixed with materials weathered from sandstone and shale. Fragments of these materials are in the profile. The subsoil and substrata are generally less acid, more friable, and more easily penetrated by tree roots than those of other Jennings soils.

If this soil is cleared of trees and planted to crops, control of erosion is needed. Management should include stripcropping and terracing. (Capability unit IIIe-1.)

Jennings silt loam, mixed substratum, 6 to 12 percent slopes, moderately eroded (JeC2).—Much of the material in the original surface layers (A horizon) of this soil has washed away; only 3 to 8 inches remains. The plow layer consists of subsoil material mixed with the remaining surface soil. In some places all of the surface soil has been lost and there are galled spots of yellowish-brown silty clay loam. In these spots are many pebbles from glacial till and fragments of sandstone and shale. Erosion is the main problem on this soil. A cropping system that consists of small grain and meadow is probably best suited. Row crops can be grown, but the soil should be stripcropped and plowed on the contour. (Capability unit IIIe-1.)

Jennings silt loam, mixed substratum, 12 to 18 percent slopes (JeD).—Most of this soil is in wooded areas where it has been protected from erosion. The surface layers (A horizon) are 8 to 12 inches thick. If this soil is cleared, its best use is meadow or pasture. A small grain can be grown 1 year in 4 if the cropping system provides meadow for 3 years. (Capability unit IVe-2.)

Jennings silt loam, mixed substratum, 18 to 25 percent slopes (JeE).—This soil occurs mainly in wooded areas where it has been protected from erosion. The surface layers (A horizon) are 8 to 10 inches thick. Surface runoff is rapid, and if this soil is cleared, erosion is a problem. Leave this soil in woods or permanent pasture, or plant pines for Christmas trees. (Capability unit VIe-2.)

Jennings soils, mixed substratum, 6 to 12 percent slopes, severely eroded (JgC3).—These soils have lost most of the material in their original surface layers (A horizon); less than 3 inches remains. The yellowish-brown to reddish-brown subsoil contains many till pebbles and fragments of sandstone and shale. Surface runoff is medium where vegetation is thick and is rapid where vegetation is sparse. Erosion is a serious problem on these

shallow soils. Best suited crops are permanent pasture, meadow, and pine Christmas trees. (Capability unit IVe–1.)

Jennings soils, mixed substratum, 12 to 18 percent slopes, severely eroded (JgD3).—These soils have lost most of the material in the original surface layers (A horizon); less than 3 inches remains. The plow layer consists mostly of the yellowish-brown to reddish-brown subsoil. Many pebbles from glacial till and fragments of sandstone and shale are on the surface. Surface runoff is rapid, and erosion is severe. In places, gullies have formed. Permanent meadow or pasture is best suited to these soils. (Capability unit VIe–1.)

Jennings and Colyer silt loams, 18 to 25 percent slopes (JrE).—This mapping unit consists of Jennings silt loam and Colyer silt loam. Profiles of these soils having a silt loam surface soil are described for the Jennings and the Colyer series elsewhere in this section. The Jennings soil in this mapping unit is deeper and higher on the slopes than the Colyer soil. The Colyer soil is shallow. This mapping unit is mostly in woods and has been protected from serious erosion. Pines are best suited to these soils. (Capability unit VIIe–3.)

Jennings and Colyer silt loams, 18 to 25 percent slopes, moderately eroded (JrE2).—These soils have only 3 to 6 inches of the original surface layers (A horizon). The rest has washed away. Surface runoff is rapid, and erosion is a problem. These soils should be kept in woods. (Capability unit VIIe–1.)

Jennings and Colyer soils, 18 to 25 percent slopes, severely eroded (JsE3).—Most of the material in the original surface layers (A horizon) of these soils has washed away; less than 3 inches remains. Tilth is very poor. Surface runoff is rapid to very rapid, and erosion is a serious problem. These soils should be planted to pines. (Capability unit VIIe–2.)

Johnsburg Series

The Johnsburg series consists of moderately deep to deep, imperfectly drained, medium-textured soils on uplands. These soils are nearly level and occur in small areas in the southwestern part of the county. They developed in loess that extends to depths of 18 to 48 inches. The loess is underlain by material weathered from stratified acid sandstone and shale. In most places the depth to underlying bedrock is more than 8 feet. The native vegetation was trees.

These soils have very dark grayish-brown to brown silt loam surface layers (A horizon) that are normally 8 to 12 inches thick. The subsoil is mainly yellowish-brown silt loam to light silty clay loam mottled with light gray, gray, and light brownish gray. The lower part of the subsoil is a fragipan.

The Johnsburg soils in this county have a total area of about one-fourth of a square mile. In most places they adjoin the Tilsit soils, which are moderately well drained.

Representative profile (Johnsburg silt loam, at end of a lane in NW¼NW¼SW¼ sec. 14, T. 2 N., R. 6 E.):

A_1 0 to 3 inches, very dark grayish-brown (10YR 3/2, moist) silt loam; weak, fine, granular structure; friable when moist; slightly acid; 2 to 4 inches thick; boundary clear and wavy.

A_2 3 to 9 inches, brown to dark-brown (10YR 4/3, moist) silt loam; weak, fine, granular structure to weak, thin, platy structure; friable when moist; slightly acid; 5 to 7 inches thick; boundary clear and wavy.

B_1 9 to 14 inches, brown (10YR 5/3, moist) silt loam; weak, fine to medium, subangular blocky structure; friable when moist; strongly acid; 4 to 6 inches thick; boundary clear and wavy.

B_{21} 14 to 18 inches, yellowish-brown (10YR 5/6, moist) heavy silt loam to light silty clay loam mottled with light brownish gray (10YR 6/2, moist); mottles are common, fine, and distinct; moderate, medium, subangular blocky to angular blocky structure; friable when moist; many brown shale fragments; strongly acid; 3 to 4 inches thick; boundary abrupt and wavy.

B_{22} 18 to 23 inches, yellowish-brown (10YR 5/6, moist) heavy silt loam to light silty clay loam mottled with light gray (10YR 7/2, moist); mottles are many, fine, and distinct; pale-brown (10YR 6/3, moist) clay skins on ped faces; weak, medium to coarse, subangular blocky structure; firm when moist; strongly acid; 4 to 7 inches thick; boundary abrupt and wavy.

B_{23m} 23 to 80 inches, light yellowish-brown (10YR 6/4, moist) silty clay loam mottled with gray (10YR 6/1, moist); mottles are many, medium, and faint; light-gray (10YR 7/2, moist) coatings of silt on ped faces and in cracks; weak, coarse, prismatic structure; very firm when moist and very sticky when wet; strongly acid.

C_1 80 to 110 inches, light yellowish-brown (10YR 6/4, moist) light silty clay loam mottled with gray (10YR 6/1, moist); mottles are many, medium, and faint; more friable than B_{23m} horizon; medium acid.

C_2 110 inches +, partly weathered, stratified sandstone, siltstone, and shale; slightly acid.

The mantle of loess in which these soils developed ranges from 18 to 48 inches in thickness. In the lower part, the surface soil is slightly acid to medium acid. The fragipan is at depths of 20 to 26 inches and is 30 to 60 inches thick. It formed entirely in the loess, entirely in the material weathered from bedrock, or partly in loess and partly in the material weathered from bedrock. Small fragments of shale and sandstone are in the lower part of the profile. These fragments vary in number and increase with depth. Stratified sandstone, siltstone, and shale are at depths of 60 to 112 inches.

Surface runoff and permeability are slow. The fragipan restricts the penetration of roots and the movement of air and water.

Johnsburg silt loam (Ju).—This is the only Johnsburg soil mapped in the county. It has a profile like the one described for the series. In most places the surface layers (A horizon) are 9 to 12 inches thick, but in a few small areas they are only 6 inches thick. The main problem on this soil is drainage. Row crops are well suited and can be grown 2 or even 3 years in succession if they are in a cropping system that includes a small grain and meadow. To drain this soil, extend ditches across the slopes and carry away excess water in grassed waterways. Install tile lines to drain the low spots. (Capability unit IIw–1.)

Kinderhook Series

The Kinderhook series consists of shallow, moderately well drained to well drained, fine-textured soils on uplands. These soils are sloping to steep and occur in the southern and southwestern parts of the county in an area locally called the Knobs. The soils formed in residuum weathered from neutral, grayish-green shale of the New Providence formation. In most places the shale is at depths less

than 40 inches. In some places it has a thin mantle of loess. The native vegetation was trees.

These soils have a grayish-brown, silty clay loam surface soil, 4 or 5 inches thick. This layer is underlain by grayish-brown to light olive-brown silty clay. The underlying shale may contain bicarbonates, sulfates, and chlorides that have a toxic effect on trees and other plants.

The Kinderhook soils in this county have a total area of about seven-eighths of a square mile. They occur with the Muskingum soils and are somewhat similar to those soils. The Kinderhook soils, however, are more acid than the Muskingum soils in the upper part of their profile and are underlain by neutral shale instead of by strongly acid bedrock of sandstone and shale.

Representative profile (Kinderhook silty clay loam, 18 to 35 percent slopes, in a woods south of county road in NE¼NW¼ grant No. 293, T. 2 N., R. 7 E.):

A_0 1 to 0 inch, partly decomposed leaf litter and twigs.
A_1 0 to 1 inch, highly organic, dark grayish-brown (2.5Y 4/2, moist) light silty clay loam; weak, fine to medium, granular structure; friable when moist; strongly acid; 1 to 2 inches thick; boundary abrupt and smooth.
A_2 1 to 4 inches, light olive-brown (2.5Y 5/4, moist) silty clay loam; moderate, medium, subangular blocky structure; firm when moist; strongly acid; 3 to 4 inches thick; boundary clear and smooth.
BC 4 to 12 inches, grayish-brown (2.5Y 5/2, moist) to light olive-brown (2.5Y 5/4, moist) silty clay; strong, medium to coarse, subangular blocky structure; firm when moist; strongly acid; 7 to 9 inches thick; boundary clear and wavy.
C_1 12 to 38 inches, partly weathered shale, olive (5Y 4/3, moist) silty clay inside peds and gray (5Y 5/1, moist) silty clay outside; moderate, coarse, subangular blocky structure; firm when moist; strongly acid in upper part to slightly acid in lower part; 18 to 30 inches thick; boundary abrupt and smooth.
D 38 inches +, neutral, grayish-green shale.

On some of the gentler upper slopes and in some local areas elsewhere, Kinderhook soils have a very thin mantle of loess with silt loam texture. Many areas have fragments of brown shale in the solum. This shale is residuum that weathered from Borden and Devonian shales, which overlie the New Providence shales.

These soils are strongly acid and have very low natural fertility and poor physical properties. For this reason trees grow slowly. Surface runoff is rapid to very rapid.

Kinderhook silty clay loam, 12 to 18 percent slopes (KhD).—This soil has a grayish-brown surface layer, 4 to 5 inches thick. Most of the soil is in woods and is best for that use. Surface runoff is rapid, and if the trees have been removed, erosion is a problem. This soil has low productivity. (Capability unit VIIe-3.)

Kinderhook silty clay loam, 18 to 35 percent slopes (KhF).—This soil has a profile similar to the one described for the series. Because some of the soil has washed away, the surface layer varies in thickness from place to place. Erosion is a hazard. This soil is not suited to cultivation and is best used for trees. Trees, however, grow slowly and produce little merchantable timber. (Capability unit VIIe-3.)

Made Land

In this miscellaneous land type, the surface soil and subsoil have been removed or have been disturbed so much that the soil can no longer be identified.

Made land (Ma).—For the most part, this land is in and around towns and villages and includes school yards, parking lots, and construction sites. It includes borrow pits that were dug during the construction of roads and highways and then graded for use. The borrow pits can be used for wildlife habitats but not for crop production. This land has not been placed in a capability unit.

Muskingum Series

The Muskingum series consists of shallow, excessively drained, medium-textured soils on uplands. These soils are steep to very steep and occur in the southwestern part of the county in an area called the Knobs. They formed in material weathered from stratified acid shale, siltstone, and sandstone. In some areas there is a thin mantle of loess. The native vegetation was trees.

These soils have a dark grayish-brown to dark-brown silt loam surface soil as much as 7 inches thick. It is underlain by channery silt loam, and this, in turn, by shale and sandstone bedrock.

The Muskingum soils in this county have a total area of about 8 square miles. In most places they adjoin the Wellston soils but are not so deep to bedrock as those soils. Also, in some areas the subsoil horizon in the Muskingum soils is more weakly developed than it is in the Wellston soils.

Representative profile (Muskingum silt loam, 35 to 70 percent slopes, north of road in SE¼SE¼ sec. 29, T. 2 N., R. 6 E.):

A_0 ½ to 0 inch, partly decomposed leaf litter and twigs.
A_1 0 to 1 inch, dark grayish-brown (10YR 4/2, moist) silt loam; weak, very fine, granular structure; friable when moist and nonsticky when wet; mildly alkaline; 1 to 3 inches thick; boundary abrupt and smooth.
A_2 1 to 7 inches, brown to dark-brown (10YR 5/3 to 4/3, moist) silt loam; weak, very fine, granular structure; very friable when moist and nonsticky when wet; some fragments of sandstone and shale; medium acid; 4 to 8 inches thick; boundary clear and wavy.
BC 7 to 14 inches, dark yellowish-brown (10YR 4/4, moist) channery silt loam; massive or very weak, medium, subangular blocky structure; friable when moist; strongly acid; 4 to 12 inches thick; boundary clear and wavy.
D_r 14 inches +, strong-brown (7.5YR 5/6, moist), partly weathered, strongly acid bedrock of shale and sandstone.

The depth to bedrock is 6 to 26 inches. Acid shale and sandstone is 1 to 15 feet thick and is underlain by neutral, grayish-green shale. Muskingum soils that adjoin Kinderhook soils may have a weakly developed B horizon.

Muskingum soils are medium acid to strongly acid and are moderately permeable. At lower elevations on north- and east-facing slopes, these soils contain more organic matter and have more available moisture than they do on south- and west-facing slopes.

Muskingum silt loam, 25 to 35 percent slopes (MuF).—This soil has silt loam surface layers (A horizon) that are 7 to 12 inches thick. Surface runoff is very rapid, but because this soil is in woods, it has been protected from excessive erosion. Plant cleared areas to trees. (Capability unit VIIe-3.)

Muskingum silt loam, 35 to 70 percent slopes (MuG).—This soil has a profile like the one described for the series. The lower slopes are escarpmentlike and are underlain by

grayish-green shale at depths of less than 18 inches. Bedrock crops out in some places.

The soil is similar to the Kinderhook soils but is darker in color than those soils and less acid. It has faster tree growth than Kinderhook soils because it is more permeable and is nontoxic. Erosion is a hazard, and the shallow depth to bedrock restricts roots. (Capability unit VIIe-3.)

Otwell Series

The Otwell series consists of deep, well-drained, medium-textured soils on terraces. These soils are gently sloping to moderately steep. They occur in the north-central, central, and south-central parts of the county. They developed in a thin mantle of loess that is underlain by mixed alluvial materials of Illinoian age washed from soils formed in loess and weathered sandstone, shale, and glacial till. Silt loam and light silty clay loam are the dominant textures of the alluvium, but thin strata of fine sand also occur.

These soils have brown silt loam surface layers (A horizon) that range normally from 10 to 12 inches in thickness, unless depleted through erosion. The subsoil is yellowish-brown to light olive-brown silt loam.

The Otwell soils in this county have a total area of about 1 square mile. They somewhat resemble the Cincinnati soils but are more friable throughout the profile than those soils and are more uniform in color and texture. Also, the Otwell soils are underlain by alluvial materials, whereas the Cincinnati soils are underlain by glacial till.

Representative profile (Otwell silt loam, 18 to 25 percent slopes, east of a road at base of hill in NW¼SW¼ SW¼ sec. 25, T. 3 N., R. 6 E.):

A_1 0 to 1 inch, brown (10YR 5/3, moist) silt loam; weak, fine, granular structure; friable when moist; medium acid; 1 to 3 inches thick; boundary abrupt and wavy.

A_2 1 to 9 inches, brown (10YR 5/3, moist) silt loam; moderate, thin, platy structure; friable when moist; medium acid; 5 to 8 inches thick; boundary clear and wavy.

A_3 9 to 14 inches, brown (10YR 5/3, moist) silt loam; moderate, medium, platy structure; friable when moist; medium acid; 4 to 6 inches thick; boundary clear and wavy.

B_1 14 to 21 inches, yellowish-brown (10YR 5/4, moist) heavy silt loam; moderate, fine to medium, subangular blocky structure; friable when moist; medium acid; 6 to 8 inches thick; boundary clear and wavy.

B_{21} 21 to 32 inches, yellowish-brown (10YR 5/4 to 5/6, moist) heavy silt loam to light silty clay loam; moderate, medium to coarse, subangular blocky structure; slightly firm when moist; medium acid; 10 to 12 inches thick; boundary abrupt and wavy.

B_{22} 32 to 37 inches, yellowish-brown (10YR 5/6 to 5/8, moist) heavy silt loam; few thin clay coatings; strong, coarse, angular and subangular blocky structure; firm when moist; medium acid; 4 to 6 inches thick; boundary abrupt and wavy.

B_{23m} 37 to 42 inches, strong-brown (7.5YR 5/6 to 5/8, moist) light silty clay loam coated with dark yellowish brown (10YR 4/4, moist); strongly cemented; structureless; strongly acid; 4 to 6 inches thick; boundary abrupt and wavy.

B_{31} 42 to 48 inches, dark yellowish-brown (10YR 4/4, moist) to yellowish-brown (10YR 5/6, moist) light silty clay loam mottled with light olive brown (2.5Y 5/4, moist); mottles are common, fine, and prominent; a few clay flows; moderate, coarse, angular and subangular blocky structure; firm when moist; strongly acid; 5 to 7 inches thick; boundary clear and wavy.

B_{32} 48 to 74 inches, light olive-brown (2.5Y 5/4 to 5/6, moist) silt loam with yellowish-brown (10YR 5/4, moist) skins; weak, coarse, subangular blocky structure; firm when moist; strongly acid.

C 74 to 82 inches, pale-olive (5Y 6/3 to 6/4, moist) fine silt; friable when moist; strongly acid.

D 82 inches +, stratified yellowish-brown (10YR 5/8, moist) and light olive-brown (2.5Y 5/4, moist) silt loam and light silty clay loam with thin strata of fine sand; strongly acid.

In some places the brown surface layers (A horizon) of these soils are 14 inches thick. In other places the original surface soil has washed away and the subsoil is exposed. The depth to stratified sand, silt, and silty clay loam ranges from 3½ to 8 feet. The reaction is acid in the upper part of the profile and slightly calcareous at depths of 10 feet or more. In some places a fragipan occurs at depths of 36 to 42 inches.

The Otwell soils are medium acid to strongly acid. They contain little organic matter and are low in essential plant nutrients, but they respond well to lime and fertilizer. Surface runoff is medium to rapid, depending on slope and vegetation. Permeability is moderate to rapid.

Otwell silt loam, 2 to 6 percent slopes (OtB).—This soil has friable, brown silt loam surface layers (A horizon) that are 8 to 14 inches thick. Some areas are sandier than others.

Included with this soil in the northwestern part of the county is about 16 acres on terraces in slack-water areas. This inclusion contains more clay than Otwell silt loam, 2 to 6 percent slopes, and is neutral instead of acid. The dark grayish-brown former surface layer has been covered with 6 to 18 inches of light-colored material. The included soil formed in silty clay loam, silty clay, and silt that are calcareous at depths of 36 inches or more.

Otwell silt loam, 2 to 6 percent slopes, erodes severely if it is not protected. Row crops can be grown for 2 years in 5, however, if the soil is stripcropped and terraced. (Capability unit IIe-1.)

Otwell silt loam, 6 to 12 percent slopes, moderately eroded (OtC2).—In most places much of the material in the original surface layers (A horizon) of this soil has washed away. Only 3 to 8 inches remains. Plowing has mixed part of the subsoil with the remaining surface soil. In some places all of the original material in the surface layers has washed away and yellowish-brown, galled spots occur. Erosion is the main problem on this soil. Improve tilth by plowing under crop residue, and plant legume and grass mixtures to protect the soil. (Capability unit IIIe-1.)

Otwell silt loam, 12 to 18 percent slopes (OtD).—This soil has been protected from erosion by trees. It has surface layers (A horizon) that are 8 to 10 inches thick. Erosion is a serious problem in areas that have been cleared. This soil should be kept in trees. (Capability unit IVe-2.)

Otwell silt loam, 18 to 25 percent slopes (OtE).—This soil has a profile like the one described for the series. It is wooded and, therefore, is protected from excessive erosion. Where trees have been removed, erosion is a serious problem. (Capability unit VIe-2.)

Otwell soils, 6 to 12 percent slopes, severely eroded (OwC3).—Less than 3 inches of the material in the original surface layers (A horizon) remains on these soils in most places. The rest has washed away. In many places the plow layer consists entirely of the yellowish-brown sub-

soil material. In a few places gullies have cut into the underlying stratified material. Preventing further erosion is the main problem of management. These soils are best suited to a cropping system that provides pasture or meadow most of the time. (Capability unit IVe–1.)

Otwell soils, 12 to 18 percent slopes, severely eroded (OwD3).—These soils have had most of the material in the original surface layers (A horizon) washed away; less than 3 inches remains. In places, gullies have penetrated the yellowish-brown subsoil and have exposed the underlying stratified materials. Permanent meadow or pasture is best suited to these soils. (Capability unit VIe–1.)

Otwell soils, 18 to 25 percent slopes, severely eroded (OwE3).—These soils are in grazed woodland and pasture on escarpmentlike short slopes. They have rapid surface runoff and a serious problem of erosion. Keep permanent vegetation on these soils throughout the year. (Capability unit VIIe–2.)

Parke Series

The Parke series consists of deep, well-drained, medium-textured soils on uplands. These soils are gently sloping to moderately steep and occur in the east-central and southeastern parts of the county. They developed in loess that extends to depths of 18 to 40 inches and are underlain by leached, sandy and somewhat gravelly outwash materials of Illinoian age. The native vegetation was trees.

These soils have a dark-brown to dark yellowish-brown silt loam surface soil. The silt loam extends to depths of more than 24 inches in some places. The subsoil is dark-brown to reddish-brown silt loam to silty clay loam.

The Parke soils in this county have a total area of about 1 square mile. In most places they adjoin the Cincinnati and Jennings soils, but they have different kinds of parent material than those soils. The Parke soils developed in loess underlain by outwash material, whereas the Cincinnati and Jennings soils developed in loess underlain by glacial till, which, in turn, is underlain by shale.

Representative profile (Parke silt loam, 6 to 12 percent slopes, moderately eroded):

A_p 0 to 8 inches, dark-brown (10YR 4/3, moist) to dark yellowish-brown (10YR 4/4, moist) silt loam; weak, fine, granular structure; friable when moist; slightly acid; 5 to 8 inches thick; boundary abrupt and wavy.

B_1 8 to 17 inches, dark-brown (7.5YR 4/4, moist) heavy silt loam to light silty clay loam; moderate, fine, subangular blocky structure; friable when moist; slightly acid; 8 to 10 inches thick; boundary clear and wavy.

B_2 17 to 25 inches, strong-brown (7.5YR 5/6, moist) heavy silt loam to light silty clay loam; moderate, coarse, subangular blocky structure; firm when moist; very strongly acid; 8 to 10 inches thick; boundary abrupt and wavy.

B_{21} 25 to 41 inches, reddish-brown (5YR 4/4, moist) to yellowish-red (5YR 4/6, moist) sandy clay loam; weak, coarse, subangular blocky structure; firm, with some cementation when moist; very strongly acid; 14 to 18 inches thick; boundary abrupt and wavy.

B_{22} 41 to 110 inches, yellowish-red (5YR 4/6, moist) to red (2.5YR 4/6, moist) sandy clay loam to clay loam; contains small, rounded gravel and thin seams of coarse sand; weak, coarse, subangular blocky structure; very firm when moist; very strongly acid; 60 to 80 inches thick; boundary clear and wavy.

B_{23} 110 to 160 inches, yellowish-red (5YR 5/6, moist) coarse sandy clay; thin seams of coarse sand and small pebbles; weak, fine, subangular blocky structure; firm when moist; very strongly acid; 40 to 60 inches thick.

C_1 160 inches +, loose, pale-brown (10YR 6/3, moist) sandy loam to slightly gravelly sand.

The thickness of the horizons in these soils varies within short distances. In many areas the parent material is not noticeably stratified. Loose sand and leaching of carbonates extend to various depths but normally to 10 to 15 feet or more.

Parke soils hold a good supply of available moisture. They have good penetration of roots. Permeability is moderate to moderately rapid. These soils are easy to recognize from their reddish color and sandy subsoil.

Parke silt loam, 2 to 6 percent slopes, moderately eroded (PaB2).—This soil has a silt loam surface layer (A horizon), 3 to 9 inches thick. Much of the material in the original surface layer has washed away. Plowing has mixed part of the subsoil with the remaining surface soil. Erosion is the main hazard. If this soil is stripcropped and terraced, row crops can be grown for 2 successive years. The cropping system should provide a small grain and meadow. (Capability unit IIe–1.)

Parke silt loam, 6 to 12 percent slopes, moderately eroded (PaC2).—This soil has a profile like the one described for the series. Much of the material in the original surface layer (A horizon) has washed away. The 5 to 8 inches that remains has been mixed with the upper part of the subsoil. Protect this soil from further erosion by stripcropping and terracing. A row crop can be grown once in a cropping system that provides a small grain and meadow. (Capability unit IIIe–1.)

Parke silt loam, 12 to 18 percent slopes (PaD).—This soil has a silt loam surface layer (A horizon), 9 to 12 inches thick. It occurs in woods and has been protected by vegetation from erosion. Where the trees have been removed, erosion is a problem. (Capability unit IVe–2.)

Parke silt loam, 18 to 25 percent slopes (PaE).—This soil has a thin surface layer of silty loess. Escarpments are present, and on them the sandy material is just beneath the thin surface layer. Erosion is a serious hazard on this soil, which needs to be kept in permanent vegetation. (Capability unit VIe–2.)

Parke soils, 6 to 12 percent slopes, severely eroded (PeC3).—The remaining part of the original surface layer of these soils is less than 3 inches thick. The plow layer consists mainly of material from the upper part of the subsoil. Erosion is a serious problem. A suitable cropping system for these soils consists of a small grain followed by 3 years of meadow. (Capability unit IVe–1.)

Parke soils, 12 to 18 percent slopes, severely eroded (PeD3).—The plow layer of these soils consists mainly of material from the upper part of the subsoil because most of the material in the original surface soil has washed away. Erosion is a serious problem, and these soils need to be kept in permanent vegetation. (Capability unit VIe–1.)

Philo Series

The Philo series consists of deep, moderately well drained, medium-textured soils on bottom lands. These soils are nearly level to gently sloping. They occur along most streams in the county, except those in the eastern

part, and are frequently flooded. They are developing in mixed alluvium washed from soils on sandstone and shale and from soils on glacial drift mantled with loess.

The surface soil is dark brown, and the subsoil, dark yellowish brown to gray. These soils have a silt loam texture that extends from the surface to depths greater than 66 inches. The native vegetation was trees.

The Philo soils in this county have a total area of about 4¼ square miles. They occur mainly with the Pope soils but also with the moderately well drained Wilbur soils. They are somewhat lighter in color, however, than those soils. Also, the alluvium in which the Philo soils are forming is more acid than that of the Wilbur soils.

Representative profile (Philo silt loam, 0 to 2 percent slopes, south of a county road in NE¼SE¼NW¼ sec. 21, T. 3 N., R. 6 E.):

A_p 0 to 6 inches, dark-brown (10YR 4/3, moist) silt loam; weak, thin, platy structure; friable when moist; neutral; 5 to 8 inches thick; boundary clear and wavy.

C_1 6 to 24 inches, dark yellowish-brown (10YR 4/4, moist) silt loam; weak, medium, subangular blocky structure; friable when moist; very strongly acid; 15 to 22 inches thick; boundary clear and wavy;

C_2 24 to 68 inches, dark-brown (7.5YR 4/4, moist) silt loam mottled with gray (7.5YR N 6/0, moist); weak, medium, subangular blocky structure; firm when moist; very strongly acid; 40 to 48 inches thick; boundary clear and wavy.

C_3 68 inches +, gray (7.5YR N 6/0, moist) silt loam mottled with dark brown (7.5YR 4/4, moist); more gray as the depth increases.

Pebbles from till and concretions of iron are scattered throughout the profile, but they vary in amount and in the depth at which they occur. At depths of about 6 feet, seams of sand are common. If they have not been limed, Philo soils are acid. They have slow runoff and moderate permeability.

Philo silt loam, 0 to 2 percent slopes (PhA).—This soil has a profile like the one described for the series. The dark-brown silt loam surface layer (A horizon) is 6 to 9 inches thick. Below a depth of 18 to 24 inches, this soil is strongly mottled with gray. It is frequently flooded and needs to have water diverted from higher areas. This soil is best suited to row crops that can be planted in spring and harvested in fall. The row crops should be grown in a cropping system that provides a small grain and legume mixture every 3 or 4 years. (Capability unit IIw–2.)

Philo silt loam, 2 to 6 percent slopes (PhB).—Overflow is the main hazard on this soil, but runoff is good when the streams are not flooded. If excess water can be removed by tile lines and grassed waterways, this soil can be used for either row crops grown continuously or in a systematic cropping system. (Capability unit IIw–2.)

Pope Series

The Pope series consists of deep, well-drained, medium-textured, strongly acid soils on bottom lands. These soils are nearly level and occur along streams and drainageways. They are developing in mixed alluvial materials that washed from soils formed in weathered sandstone, shale, and glacial till material that has a thin mantle of loess. The surface soil is dark brown to brown, and the subsoil, dark yellowish brown. The native vegetation was trees.

The Pope soils in this county have a total acreage of about 1 square mile. In most places they adjoin the moderately well drained Philo soils. They are somewhat similar to the well-drained Haymond soils but are more acid than those soils.

Representative profile (Pope silt loam, 25 feet west of a creek in NE¼SE¼NW¼ sec. 21, T. 3 N., R. 6 E.):

A_p 0 to 4 inches, dark-brown to brown (10YR 4/3 to 5/3, moist) silt loam; weak, fine, granular structure; friable when moist; neutral; 3 to 8 inches thick; boundary abrupt and wavy.

C_1 4 to 9 inches, dark-brown to brown (10YR 4/3 to 5/3, moist) silt loam; strong, thin, platy structure; friable when moist; strongly acid; 4 to 6 inches thick; boundary abrupt and wavy.

C_2 9 to 20 inches, dark yellowish-brown (10YR 4/4, moist) silt loam; weak, subangular blocky structure; friable when moist; strongly acid; 10 to 12 inches thick.

C_3 20 to 46 inches, dark yellowish-brown to yellowish-brown (10YR 4/4 to 5/4, moist) silt loam; weak, coarse, subangular blocky structure; firm when moist; strongly acid.

Fragments of sandstone and shale are common in the alluvium from sandstone and shale, especially in the bottom of small streams. Alluvium in the large stream valleys contains pebbles from glacial till. In some places and at variable depths are seams and pockets of sand. Coarse, stratified material is at depths of 4 to 7 feet.

The Pope soils have moderate to rapid permeability. If they have not been limed, they are normally strongly acid.

Pope silt loam (Po).—This is the only Pope soil mapped in Scott County. It has a profile like the one described for the series. The surface layer (A horizon) is 3 to 8 inches thick. This soil is flooded at times, but water drains quickly and crops are seldom lost. Row crops are best suited to this soil. (Capability unit I–2.)

Robinson Series

The Robinson series consists of deep, poorly drained, medium-textured soils on terraces. These soils are nearly level and occur mainly in areas southeast of Scottsburg. They developed in a thin mantle of silt and are underlain by mixed, stratified deposits of silt and light silty clay loam materials of Illinoian age that washed from soils formed in loess and weathered sandstone, shale, and glacial till. The native vegetation was trees.

In cultivated areas the surface layers (A horizon) are light-gray silt loam mottled with yellowish brown. They are 9 to 12 inches thick. The subsoil is light-gray silt loam mottled with pale brown and yellowish brown. The silt loam extends to variable depths.

The Robinson soils in this county have a total area of about one-fourth of a square mile. Most areas are surrounded by the Dubois soils, which are imperfectly drained. The Robinson soils are somewhat similar to the poorly drained Clermont soils on uplands. They are underlain, however, by stratified mixed materials, whereas the Clermont soils are underlain by Illinoian glacial till.

Representative profile (Robinson silt loam, in the southwestern corner of a wooded area in NW¼NE¼NE¼ sec. 29, T. 3 N., R. 7 E.):

A_1 0 to 1 inch, dark-gray (10YR 4/1, moist) silt loam; weak, fine, granular structure; friable when moist;

medium to strongly acid; ½ to 2 inches thick; boundary abrupt and wavy.

A_{21} 1 to 6 inches, light brownish-gray (10YR 6/2, moist) silt loam mottled with brownish yellow (10YR 6/6, moist); mottles are common, medium, and distinct; weak, fine, granular structure to weak, fine, platy structure; friable when moist; very strongly acid; 4 to 6 inches thick; boundary clear and wavy.

A_{22} 6 to 11 inches, light-gray (10YR 7/2, moist) silt loam mottled with yellowish brown (10YR 5/8, moist); mottles are common, fine, and distinct; weak, medium, subangular blocky structure with some very weak, platy structure in spots; friable when moist; very strongly acid; 4 to 6 inches thick; boundary clear and wavy.

B_1 11 to 16 inches, light-gray (10YR 7/1, moist) silt loam mottled with pale brown (10YR 6/3, moist) and yellowish brown (10YR 5/8, moist); mottles are common, fine, and distinct; moderate, fine to medium, subangular blocky structure; friable when moist; very strongly acid; 4 to 6 inches thick; boundary clear and wavy.

B_{21} 16 to 22 inches, brownish-yellow (10YR 6/6, moist) silt loam mottled with light gray (10YR 7/1, moist); mottles are many, medium, and distinct; moderate, medium, subangular blocky structure; firm when moist; very strongly acid; 5 to 7 inches thick; boundary clear and wavy.

B_{22} 22 to 37 inches, gray (10YR 6/1, moist) silt loam mottled with yellowish brown (10YR 5/6, moist); ped faces coated with white (10YR 8/1, moist) silt; mottles are many, medium, and distinct; weak, coarse, subangular blocky structure; firm when moist; very strongly acid; 12 to 18 inches thick; boundary gradual and irregular.

B_{23m} 37 to 60 inches, yellowish-brown (10YR 5/6 to 5/8, moist) light silty clay loam mottled with gray (10YR 6/1, moist); weak, coarse, prismatic structure breaking to very weak, very coarse, subangular blocky structure; very firm when moist, slightly sticky when wet; very strongly acid; many iron concretions; 20 to 28 inches thick; boundary gradual and wavy.

B_3 60 to 66 inches, gray (10YR 6/1, moist) silty clay loam mottled with yellowish brown (10YR 5/6 to 5/8, moist); mottles are common, fine, and distinct; firm when moist, slightly sticky when wet; neutral.

C 66 inches +, dark-brown (10YR 3/3, moist), stratified silt, silty clay loam, and fine sand mottled with gray (10YR 6/1, moist); mottles are common, fine, and distinct; neutral to mildly alkaline.

The depth to the subsoil and the thickness of its layers vary. In some places neutral, stratified sand, silt, and clay materials are at depths of 5 to 7 feet. In most places, however, this neutral material begins at depths of 8 feet or more. Carbonates may be present at 10 feet. The concretions of iron and manganese vary in amount.

Robinson soils have slow permeability and very slow surface runoff. They have a low content of organic matter and low natural fertility. If they have not been limed, they are very strongly acid. They have a fragipan in the lower part of the subsoil.

Robinson silt loam (Rb).—This is the only Robinson soil mapped in Scott County. It has a profile like the one described for the series. Drainage is a serious problem. Provide tile lines, and where the slopes are steep enough, extend dead furrows or shallow ditches across the slopes to carry away excess water. Fill in slight depressions and level other areas. This soil is suited to row crops. (Capability unit IIIw-1.)

Rossmoyne Series

The Rossmoyne series consists of deep, moderately well drained, medium-textured soils on uplands. These soils are nearly level to sloping and occur throughout the county. They developed in loess that extends to depths of 10 to 40 inches. The loess is underlain by weathered till of Illinoian age. The native vegetation was trees.

These soils have dark grayish-brown to dark yellowish-brown silt loam surface layers (A horizon) that are as much as 12 inches thick in uneroded areas. The subsoil is yellowish-brown silt loam to silty clay loam mottled with gray and brown in the lower part.

The Rossmoyne soils in this county have a total area of about 24 square miles. In most places they adjoin the imperfectly drained Avonburg soils and the well-drained Cincinnati soils. They are somewhat similar to the Cana soils, but they are deeper than those soils and are underlain by calcareous till instead of by acid, black shale.

Representative profile (Rossmoyne silt loam, 2 to 6 percent slopes, moderately eroded, east of highway in NW¼ NE¼ sec. 11, T. 3 N., R. 7 E.):

A_p 0 to 6 inches, dark-brown to dark grayish-brown (10YR 3/3 to 4/2, moist) silt loam; strong, fine to very fine, granular structure; friable when moist; slightly acid; 5 to 8 inches thick; boundary abrupt and smooth.

A_2 6 to 10 inches, dark-brown to dark yellowish-brown (10YR 4/3 to 4/4, moist) silt loam; weak, thin, platy structure breaking to weak, fine, granular structure; friable when moist; medium acid; 3 to 5 inches thick; boundary clear and smooth.

B_1 10 to 15 inches, yellowish-brown (10YR 5/4, moist) silt loam; moderate, fine to medium, subangular blocky structure; friable when moist; medium acid; 4 to 8 inches thick; boundary clear and smooth.

B_{21} 15 to 27 inches, yellowish-brown (10YR 5/6, moist) silt loam; few, faint, light-gray mottles in lower part; moderate, medium to coarse, subangular blocky structure; friable when moist; strongly acid; 10 to 15 inches thick; boundary abrupt and wavy.

B_{22m} 27 to 35 inches, pale-yellow (2.5Y 8/4, moist) heavy silt loam mottled with light olive brown (2.5Y 5/4, moist); mottles are many, fine, and distinct; moderate, medium to coarse, prismatic structure breaking to moderate, medium to coarse, subangular blocky structure; firm when moist; strongly acid; 7 to 10 inches thick; boundary clear and irregular.

B_{23m} 35 to 60 inches, dark yellowish-brown (10YR 4/4, moist) silty clay loam mottled with grayish brown to dark grayish brown (2.5Y 5/2 to 4/2, moist); mottles are many, medium, and prominent; few till pebbles and many concretions of iron and manganese; moderate, coarse, prismatic structure; very firm when moist; strongly acid.

B_3 60 to 120 inches, grayish-brown to dark grayish-brown (10YR 5/2 to 4/2, moist) and yellowish-brown (10YR 5/6, moist) silty clay loam to silt loam; the quantity of partly weathered pebbles and rock fragments increases with increasing depth; weak, coarse, blocky structure or massive (structureless); upper part strongly acid and lower part medium to slightly acid.

C 120 inches +, calcareous loamy till of Illinoian age.

The loess in which these soils developed ranges from 10 to 40 inches in thickness. The glacial till, in places, extends to depths greater than 12 feet; at depths below 10 to 12 feet, the till is calcareous. It is underlain by acid oil shale; neutral clay shale; or stratified, acid sandstone, siltstone, and brown shale. If these materials occur at depths of less than 10 feet, the layer of calcareous glacial till is absent or is very thin.

The Rossmoyne soils are strongly acid except when limed. They contain little organic matter and have low natural fertility. A fragipan is in the lower part of the subsoil, but the soils are moderately permeable.

Rossmoyne silt loam, 0 to 2 percent slopes (RmA).—The surface layers (A horizon) of this soil are 9 to 12 inches thick. In other respects this soil has a profile similar to the one described for the series. Surface runoff is slow and permeability is moderate. This soil is well suited to row crops. These crops can be grown for as many as 3 years in 6 if the cropping system provides a small grain and 2 years of meadow. (Capability unit I–1.)

Rossmoyne silt loam, 2 to 6 percent slopes (RmB).—This soil has surface layers (A horizon) 8 to 12 inches thick, which are thicker than those in the profile described for the series. Because erosion is a hazard, this soil should be cultivated on the contour. Row crops are well suited and can be grown for 2 years in 5 if this soil is stripcropped or terraced. Follow the row crops by a small grain and 2 years of meadow. (Capability unit IIe–1.)

Rossmoyne silt loam, 2 to 6 percent slopes, moderately eroded (RmB2).—This soil has a profile like the one described for the series. All except 3 to 8 inches of the material in the original surface layers has washed away. In some small areas the plow layer consists mostly of the light-colored subsoil material, which has been mixed with the remaining surface soil. Erosion is the main problem. Row crops are well suited to this soil if it is stripcropped and terraced and the cropping system provides a small grain and meadow. (Capability unit IIe–1.)

Rossmoyne silt loam, 6 to 12 percent slopes, moderately eroded (RmC2).—In most places this soil has had all except 3 to 8 inches of the material in the original surface layers (A horizon) washed away. In cultivated areas the plow layer is mostly subsoil material mixed with the remaining surface soil. The surface layer in some wooded areas has been protected from excessive erosion by vegetation; here, the surface layers are darker in color and are 9 to 12 inches thick. Erosion is the main problem. A cropping system that provides a small grain and 3 years of meadow is probably best suited to this soil. (Capability unit IIIe–1.)

Rossmoyne soils, 2 to 6 percent slopes, severely eroded (RoB3).—Most or all of the material in the original surface layers (A horizon) of these soils has washed away. Less than 3 inches remains in some places. In most places the plow layer consists entirely of subsoil material. On the surface are many pebbles from glacial till. These soils contain little organic matter and are low in plant nutrients. Amendments are needed. Erosion is a serious problem, but it can be controlled by stripcropping and terracing. A row crop can be grown for 1 year if it is followed by 3 years of meadow. (Capability unit IVe–1.)

Rossmoyne soils, 6 to 12 percent slopes, severely eroded (RoC3).—These soils have had most or all of the material in their original surface layers (A horizon) washed away. In most places the plow layer consists entirely of the yellowish-brown subsoil material. Generally, less than 3 inches of the original surface layers remains. These soils contain little organic matter and are low in plant nutrients. Erosion is a serious problem. Apply fertilizer and plow under plant residue to maintain fertility. To control erosion, divert water from higher areas and stripcrop and terrace these soils. Permanent pasture, meadow, or pine Christmas trees are probably best suited to these soils. (Capability unit IVe–1.)

Stendal Series

The Stendal series consists of deep, imperfectly drained, medium-textured soils on bottom lands. These soils are nearly level and occur in the northern, northwestern, and central parts of the county. They are developing in mixed alluvial materials that washed from soils formed in a thin cap of loess on top of weathered sandstone, shale, and glacial till. The native vegetation was trees.

These soils have surface layers (A horizon) of brown to yellowish-brown silt loam mottled with gray. These layers are 5 to 11 inches thick. The subsoil is yellowish-brown silt loam mottled with gray and light brownish gray.

The Stendal soils in this county have a total area of about 26 square miles. In most places they adjoin the moderately well drained Philo soils and the poorly drained Atkins soils. They are somewhat similar to the Wakeland soils but have lighter colored surface layers than those soils and are more acid. The Stendal soils are strongly acid, whereas the Wakeland soils are medium acid to neutral.

Representative profile (Stendal silt loam, 200 feet west of creek and south of road in NE¼SE¼NW¼ sec. 21, T. 3 N., R. 6 E.):

A_1 0 to 2 inches, yellowish-brown (10YR 5/4, moist) silt loam; very weak, thin, platy structure; friable when moist; strongly acid; 2 to 6 inches thick; boundary abrupt and wavy.

A_{12} 2 to 6 inches, brown (10YR 5/3, moist) silt loam mottled with gray (10YR 5/1, moist); mottles are few, fine, and faint; very weak, medium, platy structure; friable when moist; strongly acid; 3 to 5 inches thick; boundary clear and wavy.

C_1 6 to 13 inches, yellowish-brown (10YR 5/4, moist) silt loam mottled with light brownish gray (10YR 6/2, moist); mottles are many, medium, and distinct; weak, coarse, subangular blocky structure; friable when moist; strongly acid; 5 to 8 inches thick; boundary clear and wavy.

C_2 13 to 72 inches +, yellowish-brown (10YR 5/4, moist) and light brownish-gray (10YR 6/2, moist) silt loam; mottles are many, medium, and distinct; weak, coarse to very coarse, subangular blocky structure; firm when moist; strongly acid.

In some areas pebbles from glacial till occur throughout the profile, and in some areas the profile contains fragments of shale. In other places the profile is practically free of pebbles and fragments.

If they have not been limed, the Stendal soils are strongly acid. They have slow to very slow surface runoff and slow permeability.

Stendal silt loam (St).—This is the only Stendal soil mapped in Scott County. It has a profile like the one described for the series. Frequent overflow and poor drainage are the main limitations to use. Divert water from higher areas, and install tile lines. Space the tile lines 70 to 80 feet apart, and lay them at a depth of 3½ feet. This soil is best suited to row crops if a small grain mixed with a legume is planted every third or fourth year. (Capability unit IIw–2.)

Tilsit Series

The Tilsit series consists of moderately deep to deep, moderately well drained, medium-textured soils on up-

lands. These soils are nearly level to gently sloping and occur in the southwestern part of the county. They developed in loess 18 to 48 inches thick. The loess is underlain by material weathered from stratified sandstone, siltstone, and shale. The native vegetation was trees.

These soils have dark-brown to dark yellowish-brown silt loam surface layers that are 8 to 12 inches thick in most places. The upper part of the subsoil is dark yellowish-brown heavy silt loam. The lower part is a fragipan.

The Tilsit soils in this county have a total area of about 2 square miles. In most places they adjoin the imperfectly drained Johnsburg soils and the well-drained Zanesville soils. The Tilsit soils are somewhat similar to the Haubstadt soils in appearance, but the horizons are more distinct than in those soils and the fragipan is more compact. In the Tilsit soils the lower part of the profile is material weathered from sandstone, siltstone, and shale; in the Haubstadt soils it is alluvial material.

Representative profile (Tilsit silt loam, 2 to 6 percent slopes, 51 feet west of woods and south of road in NE¼SE¼NE¼ sec. 32, T. 3 N., R. 6. E.):

A_0 ½ to 0 inch, partly decomposed leaf litter and twigs: ½ to 1 inch thick.

A_1 0 to 2 inches, dark-brown (10YR 4/3, moist) silt loam; strong, very fine, granular structure; friable when moist; strongly acid; 1 to 4 inches thick; boundary clear and smooth.

A_2 2 to 10 inches, dark-brown (10YR 4/3, moist) silt loam; strong, fine to medium, subangular blocky structure; friable when moist; strongly acid; 4 to 8 inches thick; boundary clear and smooth.

B_1 10 to 16 inches, dark yellowish-brown (10YR 4/4, moist) heavy silt loam; moderate, fine, subangular blocky structure; friable when moist; strongly acid; 5 to 7 inches thick; boundary clear and smooth.

B_{21} 16 to 24 inches, dark yellowish-brown (10YR 4/4, moist) silty clay loam; strong, fine to medium, subangular blocky structure; friable when moist; strongly acid; 7 to 9 inches thick; boundary clear and smooth.

B_{22} 24 to 35 inches, light yellowish-brown (10YR 6/4, moist) silty clay loam mottled with dark yellowish brown (10YR 4/4, moist) and light brownish gray (10YR 6/2, moist); moderate, medium to coarse, subangular blocky structure; firm when moist; strongly acid; 9 to 13 inches thick; boundary gradual and wavy.

B_{23m} 35 to 47 inches, light yellowish-brown (10YR 6/4, moist) silty clay loam mottled with yellowish brown (10YR 5/4, moist) and light brownish gray (10YR 6/2, moist); mottles are many, medium, and faint to distinct; weak, medium, prismatic structure; firm when moist; strongly acid; 10 to 14 inches thick; boundary gradual and wavy.

B_{24m} 47 to 54 inches, pale-brown to light yellowish-brown (10YR 6/3, to 6/4, moist) silty clay loam mottled with light gray (10YR 7/2, moist); mottles are many, medium, and distinct; weak, fine to medium, prismatic structure; firm when moist; strongly acid; 6 to 9 inches thick; boundary diffuse and irregular.

B_{3m} 54 to 75 inches, yellowish-brown (10YR 5/4 to 5/8, moist) silty clay loam to silt loam mottled with light brownish gray (10YR 6/2, moist); mottles are many, medium, and distinct; weak, prismatic structure to massive (structureless); very firm when moist; strongly acid; 18 to 24 inches thick.

D_r 75 inches +, stratified layers of shale, siltstone, and sandstone.

In cultivated areas, the surface layers are lighter in color and are lower in organic-matter content than in other areas. The mantle of loess in which these soils developed is 18 to 48 inches thick. The fragipan formed entirely in the loess, entirely in the material weathered from bedrock, or partly in loess and partly in the weathered material. Stratified sandstone, siltstone, and shale are at depths of 7 to 9 feet.

If these soils have not been limed, they are strongly acid. They have moderate permeability, but the fragipan restricts the penetration of roots and moisture.

Tilsit silt loam, 0 to 2 percent slopes (TmA).—In most places the surface layers (A horizon) of this soil are 8 to 12 inches thick. In a few small areas, less than 8 inches of the material in the original surface layers remains and the yellowish-brown plow layer consists partly of subsoil material. This soil has slow surface runoff but is not limited in use. Row crops are well suited and can be grown for 2 or 3 successive years if the cropping system provides a small grain and meadow. (Capability unit I–1.)

Tilsit silt loam, 2 to 6 percent slopes (TmB).—This soil has a profile like the one described for the series. The surface layers (A horizon) are 8 to 12 inches thick. Erosion is a hazard, but it can be controlled by terracing and stripcropping. This soil is suited to row crops. (Capability unit IIe–1.)

Tilsit silt loam, 2 to 6 percent slopes, moderately eroded (TmB2).—In most areas this soil has less than 8 inches of its original surface layers (A horizon). In a few small areas all of the original surface layers have washed away. The lighter colored subsoil material is exposed or is mixed with the remaining surface soil by plowing. Row crops are suited, but erosion must be controlled. Plow under plant residue to improve tilth, and stripcrop and till this soil on the contour. (Capability unit IIe–1.)

Trappist Series

The Trappist series consists of moderately deep, well drained to moderately well drained, medium-textured soils on uplands. These soils are gently sloping to moderately steep and occur in the eastern and southern parts of the county. They developed in shallow loess that is less than 18 inches thick in most places. The loess is normally underlain by material weathered from dark-brown shale of the New Albany formation, which is of Devonian age, or from grayish-green, soft clay shale of the New Providence formation. Bedrock normally occurs at depths of 30 to 50 inches. The native vegetation was trees.

These soils have brown to yellowish-brown silt loam surface layers (A horizon) that, where not eroded, range from 6 to 12 inches in thickness. The subsoil is mostly dark-brown to yellowish-brown silt loam to silty clay loam. It is very strongly acid in reaction.

The Trappist soils in this county have a total area of about 5 square miles. In places where they developed on New Albany shale, they adjoin the well-drained Jennings soils and the excessively drained Colyer soils. Where they developed on the grayish-green clay shale of the New Providence formation, they occur at the base of the Knobs, bordering or near the Muskingum soils.

The Trappist soils are shallower than the Jennings soils and do not have a layer of glacial till like that in those soils. They are deeper than the Colyer soils, which do not have a textural B horizon.

Profile of a Trappist soil formed in loess underlain by material weathered from dark-brown to black, acid oil shale (Trappist silt loam, 12 to 25 percent slopes, east of highway in NW¼NE¼ sec. 14, T. 3 N., R. 7 E.):

A_0 ½ to 0 inch, accumulated layer of partly decomposed forest litter and grasses.

A_1 0 to 2 inches, yellowish-brown (10YR 5/4, moist) silt loam; weak, very fine to fine, granular structure; friable when moist; strongly acid; 1 to 2 inches thick; boundary clear and smooth.

A_2 2 to 5 inches, brown to yellowish-brown (10YR 5/3 to 5/4, moist) silt loam; weak, thin, platy structure, in places breaking to weak, fine, granular structure; friable when moist; strongly acid; 3 to 4 inches thick; boundary clear and smooth.

B_1 5 to 11 inches, dark-brown (7.5YR 4/4, moist) heavy silt loam to silty clay loam; moderate, fine to medium, angular blocky and subangular blocky structure; friable when moist; strongly acid; 5 to 7 inches thick; boundary clear and smooth.

B_{21} 11 to 19 inches, dark-brown to strong-brown (7.5YR 4/4 to 5/6, moist) heavy silt loam to silty clay loam; strong, medium to coarse, subangular blocky structure; firm when moist and slightly plastic when wet; strongly acid; 7 to 10 inches thick; boundary abrupt and smooth.

B_{22} 19 to 28 inches, dark-brown (7.5YR 4/4, moist) silty clay loam; strong, coarse, angular blocky structure breaking to strong, medium to fine, angular blocky structure; firm when moist and very sticky when wet; a few shale fragments in lower part of horizon; strongly acid; 8 to 10 inches thick; boundary clear and smooth.

C 28 to 38 inches, brown (7.5YR 5/4, moist) and pinkish-gray (7.5YR 6/2, moist) silty clay loam; many small, hard, dark-brown fragments of shale, their number increasing with depth; strongly acid to very strongly acid; 6 to 14 inches thick.

D_r 38 inches +, dark-brown to black, acid shale.

The loess in which these soils developed is as much as 18 inches thick in places. In some places there is no loess. The Trappist soils border the glacial till plain in some areas, and in these areas a small amount of weathered glacial till occurs in the subsoil.

The Trappist soils that developed in material weathered from acid, dark-brown oil shale are well drained and have a dark-brown, mottle-free subsoil that permits water, air, and roots to move freely through it. This hard, dark-brown shale weathers chiefly to soil material of silt loam and silty clay loam texture. In the Trappist soils that developed from neutral, grayish-green, soft clay shale, the lower part of the subsoil and the parent material contain more clay than soils developed from the acid, dark-brown shale. Also, these soils are more blocky in structure, more compact, and less permeable to moisture than the soils developed from acid shale. The weathered clay shale is commonly extremely acid to very strongly acid. The depth to either the oil shale or the clay shale varies from 20 to 50 inches.

If they have not been limed, these soils are strongly acid. They contain little organic matter and are low in natural fertility. They are moderately permeable. The shallow depth to shale restricts penetration of roots and limits the moisture-supplying capacity. The clay shale produces soils that are highly erosive when cultivated.

Profile of a Trappist soil formed in material weathered from grayish-green, soft clay shale (Trappist silt loam, 6 to 12 percent slopes, approximately one-fourth mile east of county road in SW¼NE¼ grant 293, T. 2 N., R. 7 E.):

A_0 ½ to 0 inch, very dark gray (10YR 3/1, moist), partly decomposed leaf litter.

A_1 0 to 2 inches, brown (10YR 5/3, moist) silt loam; weak, fine, granular structure; friable when moist; very strongly acid; 2 to 3 inches thick; boundary clear and smooth.

A_2 2 to 5 inches, yellowish-brown (10YR 5/4, moist) silt loam; weak, thin, platy structure; friable when moist; very strongly acid; 2 to 4 inches thick; boundary clear and wavy.

B_1 5 to 10 inches, dark yellowish-brown (10YR 4/4, moist) light silty clay loam with faint, yellowish-brown (10YR 5/4, moist) clay skins; moderate, fine, subangular and angular blocky structure; friable when moist; slightly sticky when wet; very strongly acid; 4 to 7 inches thick; boundary clear and wavy.

B_{21} 10 to 16 inches, dark yellowish-brown (10YR 4/4, moist) silty clay loam mottled with light olive brown (2.5Y 5/4, moist); distinct, brown (10YR 5/3, moist) clay skins; mottles are common, medium, and prominent; moderate, medium, subangular and angular blocky structure; slightly firm when moist and slightly sticky when wet; very strongly acid; 5 to 7 inches thick; boundary clear and wavy.

B_{22} 16 to 22 inches, dark-brown (7.5YR 4/4, moist) silty clay loam mottled with reddish brown (2.5YR 5/4, moist); distinct, olive (5Y 5/3, moist) clay skins; mottles are many, medium, and prominent; moderate, medium, angular blocky structure; firm when moist and sticky when wet; very strongly acid; 5 to 7 inches thick; boundary clear and wavy.

B_{23} 22 to 32 inches, light olive-brown (2.5Y 5/4, moist) silty clay to clay loam mottled with dark brown (7.5YR 4/4, moist); clay flows; mottles are many, medium, and prominent; moderate, coarse, angular blocky structure; firm when moist and very sticky when wet; very strongly acid; 10 to 12 inches thick; boundary gradual and wavy.

C_1 or B_3 32 to 50 inches, olive (5Y 5/4, moist) and dark-brown (7.5YR 4/4, moist) clay, with faint, olive (5Y 5/3, moist) clay skins; strong, very coarse, angular blocky structure; very firm when moist and very sticky when wet; partly weathered, soft clay shale fragments in the lower part of the horizon; strongly acid; 16 to 20 inches thick; boundary gradual.

C_2 50 inches +, grayish-green shale; slightly acid to neutral.

Trappist silt loam, 2 to 6 percent slopes (TrB).—This soil has fairly shallow, yellowish-brown silt loam surface layers (A horizon) that are 6 to 9 inches thick. The subsoil is yellowish brown and normally is mottled with gray below 16 to 20 inches. In this soil, water, air, and roots are restricted more by the compact lower subsoil and the clay shale parent material than they are in soils developed on the dark-brown oil shale. The soft clay shale occurs at 25 to 40 inches.

Much of this soil has been kept in grass or forest. If cultivated, it is susceptible to erosion. The productivity for either farm crops or trees is very low. If row crops are grown, keep crop residue on the surface and plant winter cover crops to keep the surface covered. If the soil is stripcropped or terraced, row crops may be grown in a cropping system that includes a small grain and meadow. (Capability unit IIe–2.)

Trappist silt loam, 2 to 6 percent slopes, moderately eroded (TrB2).—Like Trappist silt loam, 2 to 6 percent slopes, this soil developed over slowly permeable grayish-green clay shale. Sheet erosion is a serious problem in clean-cultivated areas; consequently, the silt loam surface soil, in most places, is less than 6 inches deep. In many small areas, the yellowish-brown silty clay loam subsoil has been plowed up and the soil is cloddy and of poor tilth. Erosion and low productivity are the main problems.

If clean-tilled crops are grown, tillage should be on the contour or along the slope. To control erosion, stripcrop or terrace the long slopes. (Capability unit IIe-2.)

Trappist silt loam, 6 to 12 percent slopes (TrC).—This soil is in wooded areas where it has been protected from excessive erosion. Its original surface layers (A horizon) are 8 to 12 inches thick. The loess in which the soil developed ranges from 12 to 18 inches in thickness, and shale is at depths of 36 to 40 inches. In cleared areas erosion is a serious problem. This soil should remain in woods. (Capability unit IIIe-2.)

Trappist silt loam, 6 to 12 percent slopes, moderately eroded (TrC2).—Much of the material in the original surface layers (A horizon) of this soil has washed away; only 3 to 8 inches remains. Plowing has mixed part of the subsoil with the remaining surface soil. Erosion and the shallow depth to shale are the main limitations to use. The cropping system best suited is probably a small grain followed by 3 years of meadow. Parts of this soil underlain by grayish-green, neutral shale are probably better suited to grass or trees than are parts underlain by dark-brown or black, acid shale. (Capability unit IIIe-2.)

Trappist silt loam, 12 to 25 percent slopes (TrE).—This soil has a profile like the one described for the series. It is in wooded areas and has been protected from erosion. The surface layers (A horizon) are about 5 to 8 inches thick. The loess in which this soil developed is 9 to 12 inches thick, and shale is at depths of 24 to 36 inches. Erosion and the shallow depth to shale are the main limitations. Trees, permanent meadow, and pasture are probably the best suited crops. (Capability unit VIe-2.)

Trappist silt loam, 12 to 25 percent slopes, moderately eroded (TrE2).—The plow layer of this soil consists of subsoil material mixed with the remaining original surface soil. Shale is at depths of 24 to 36 inches. This shallow depth makes the soil droughty in dry weather. Another limitation is the erosion hazard. Best suited crops are trees, permanent meadow, or pasture. (Capability unit VIe-2.)

Trappist silt loam, moderately well drained, 2 to 6 percent slopes (TnB).—The surface layers (A horizon) of this soil are about 6 inches thick in most places but are as much as 12 inches thick in noneroded and wooded areas. Drainage is not so good as on most Trappist soils. It is restricted by a compact, slowly permeable fragipan that begins at depths of 26 to 30 inches and extends to the shale at about 40 inches. The subsoil is mottled with gray from 14 to 20 inches downward. Fairly unweathered shale is at depths of 30 to 40 inches.

Erosion, the shallow depth to shale, and the low moisture-supplying capacity are the main limitations to use. Row crops are suited, but to control erosion, the soil should be plowed on the contour and stripcropped or terraced. (Capability unit IIe-2.)

Trappist silt loam, moderately well drained, 2 to 6 percent slopes, moderately eroded (TnB2).—Much of the material in the original surface layers (A horizon) of this soil has washed away. Small areas have lost all of the surface soil, and the subsoil is exposed. In many places the plow layer consists of subsoil material mixed with the original surface soil. In a few areas where gullies have been smoothed over, shale fragments are on the surface and the soil is reddish brown when moist. Erosion and the shallow depth to shale restrict the use of this soil. Row crops are suited, but to help control further erosion, provide stripcropping and terracing. Plant winter cover crops and leave plant residue on the surface to maintain a cover on this soil as much of the time as possible. (Capability unit IIe-2.)

Trappist soils, 6 to 12 percent slopes, severely eroded (TsC3).—Erosion has been so severe on these soils that less than 2 inches of the material in the original surface layers (A horizon) remains. The surface soil is mostly yellowish-brown silty clay loam. In some areas, fragments of shale are on the surface, and gullies have cut into the underlying shale in places. Erosion and the shallow depth to shale are serious problems. These soils should be kept in permanent vegetation.

Included with this soil are several areas on slopes of less than 6 percent. Many of these inclusions formed in material weathered from grayish-green shale, which is more slowly permeable and more erosive than the dark-brown shale. (Capability unit VIe-1.)

Trappist soils, 12 to 25 percent slopes, severely eroded (TsE3).—These soils have lost all of the material in their original surface layers (A horizon) and, in places, part of their subsoil. The depth to shale is 6 to 30 inches. Because of this shallowness, the moisture-holding capacity is low and these soils are droughty. Their organic-matter content and fertility are low. Pines are best suited to these soils. (Capability unit VIIe-2.)

Wakeland Series

The Wakeland series consists of deep, imperfectly drained, medium-textured soils on bottom lands. These soils are in the southwestern, south-central, and eastern parts of the county. Some areas are in slight depressions and swales bordering the hillsides. The soils are developing in mixed alluvial materials that washed from soils formed in loess and in weathered sandstone, calcareous glacial till, and neutral clay shale. Sufficient lime is contained in this material to make these soils medium acid to neutral in reaction. The native vegetation was trees.

These soils have a dark-brown silt loam surface soil about 8 inches thick. The subsoil is dark brown to dark yellowish brown mottled with gray and grayish brown.

The Wakeland soils in this county have a total area of about 2 square miles. In most places they adjoin the moderately well drained Wilbur soils but are farther from the streams than those soils. They are somewhat similar to the Stendal soils, but they are less acid than those soils and slightly darker colored in the surface soil.

Representative profile (Wakeland silt loam, south of highway in NE¼SW¼NE¼ sec. 19, T. 3 N., R. 8 E.):

A_{1p} 0 to 8 inches, dark-brown (10YR 4/3, moist) silt loam; weak, fine, granular structure; friable when moist;

neutral; 7 to 8 inches thick; boundary clear and smooth.

A_{12} 8 to 11 inches, dark-brown (10YR 4/3, moist) silt loam; weak, medium to thick, platy structure and weak, fine, granular structure; friable when moist; neutral; 3 to 4 inches thick; boundary clear and smooth.

C_1 11 to 14 inches, dark yellowish-brown (10YR 4/4, moist) silt loam mottled with grayish brown (10YR 5/2, moist); mottles are common, fine, and distinct; weak, medium to thick, platy structure; friable when moist; neutral; 2 to 5 inches thick; boundary clear and wavy.

C_2 14 to 24 inches, yellowish-brown (10YR 5/4, moist) silt loam mottled with gray (10YR 6/1, moist) and yellowish red (5YR 4/6, moist); mottles are many, medium, and prominent; weak, medium to thick, platy structure and weak, coarse, subangular blocky structure; slightly firm when moist; medium acid; 8 to 12 inches thick; boundary clear and wavy.

C_3 24 to 49 inches, gray (10YR 6/1, moist) silt loam mottled with yellowish brown (10YR 5/6, moist) and brown (10YR 5/3, moist); mottles are many, medium to coarse, and prominent; weak, medium, platy structure; friable when moist; medium acid.

C_4 49 to 56 inches, dark-brown (10YR 4/3, moist) silt loam mottled with yellowish brown (10YR 5/6, moist), very dark brown (10YR 2/2, moist), and gray (10YR 6/1, moist); mottles are many, medium, and prominent; friable when moist; slightly acid.

C_5 56 inches +, stratified sand, silt, and silty clay loam of mixed origin; slightly acid.

In most places the Wakeland soils are medium acid to neutral. In the southwestern and south-central parts of the county, however, they are underlain by neutral, grayish-green shale and are medium acid to slightly acid. In the eastern part of the county, they have been affected by limestone or other calcareous material and are neutral to slightly acid. In places where water seeps from higher areas, the Wakeland soils are more poorly drained and more strongly mottled than elsewhere. These soils have slow permeability and are frequently flooded.

Wakeland silt loam (Wa).—This is the only Wakeland soil mapped in Scott County. It has a profile like the one described for the series. Included with this soil in the northeastern part of the county is 15 acres on high bottoms or low terraces subject to overflow. The soils in this inclusion formed in slack-water materials and are classified elsewhere as Zipp silt loam. The surface soil is dark grayish-brown silt loam, and the subsoil, dark yellowish-brown silty clay loam mottled with gray.

Wakeland silt loam is normally neutral in reaction throughout the profile and is underlain by layers of silty clay loam and silt. Frequent overflows and poor drainage are the main problems of management. To drain this soil, install tile lines spaced 70 to 80 feet apart at a depth of 3½ feet. In places it is difficult to provide suitable tile outlets. If protected from overflow, continuous row crops are suited to this soil. (Capability unit IIw–2.)

Wellston Series

The Wellston series consists of moderately deep, well-drained, medium-textured soils on uplands. These soils are gently sloping to steep and occur in the southwestern part of the county in an area called the Knobs. They developed in a layer of loess less than 24 inches thick that is underlain by material weathered from stratified sandstone, siltstone, and shale. Bedrock is at depths of 24 to 36 inches.

These soils have dark grayish-brown to yellowish-brown silt loam surface layers (A horizon) that are as much as 24 inches thick in places. In some places the surface layers have washed away and the yellowish-brown silty clay loam subsoil is exposed.

The Wellston soils in this county have a total area of about 4 square miles. In most places they adjoin the excessively drained Muskingum and the well-drained Zanesville soils. They are deeper than the Muskingum soils and have a textural B horizon, which the Muskingum soils lack. The Wellston soils are not so deep as the Zanesville soils and, unlike those soils, do not have a fragipan.

Representative profile (Wellston silt loam, 18 to 25 percent slopes, north of road in SE¼SE¼ sec. 29, T. 2 N., R. 6 E.):

A_0 ½ to 0 inch, partly decomposed leaf litter and twigs.

A_1 0 to 3 inches, dark grayish-brown to brown (10YR 4/2 to 4/3, moist) silt loam; weak, very fine, granular structure; friable when moist and nonsticky when wet; neutral; 1 to 3 inches thick; boundary clear and smooth.

A_2 3 to 9 inches, yellowish-brown (10YR 5/4, moist) silt loam; weak, very fine, granular structure; friable when moist and slightly sticky when wet; medium acid; 5 to 7 inches thick; boundary clear and smooth.

B_1 9 to 18 inches, dark yellowish-brown (10YR 4/4, moist) light silty clay loam; weak, very fine to fine, subangular blocky structure; friable when moist and slightly sticky when wet; strongly acid; 7 to 9 inches thick; boundary clear and smooth.

B_2 18 to 25 inches, dark yellowish-brown (10YR 4/4, moist) silty clay loam; moderate to strong, fine to medium, subangular blocky structure; firm when moist and slightly sticky when wet; strongly acid; 3 to 9 inches thick; boundary abrupt and wavy.

B_3 25 to 30 inches, dark yellowish-brown (10YR 4/4) clay loam to loam; contains fragments of sandstone; massive (structureless); friable; strongly acid; 3 to 10 inches thick; clear, wavy boundary.

D_r 30 inches +, stratified, acid sandstone and shale.

The loess in which these soils formed is as much as 24 inches thick in some places and is missing in other places. The loess is underlain by acid sandstone and shale, 1 to 15 feet or more thick. Below this is neutral, grayish-green shale.

If they have not been limed, the Wellston soils are strongly acid and are moderately permeable. On north-facing slopes, the surface soil is darker in color and thicker than on south-facing slopes and has a better supply of available moisture.

Wellston silt loam, 2 to 6 percent slopes (WeB).—This soil occurs on narrow ridgetops in wooded areas. It has been protected from erosion by vegetation, and its surface layers (A horizon) are 9 to 12 inches thick. The depth to bedrock is about 36 inches. Because of its location, this soil should remain in woods. If the trees are removed, erosion is potentially severe, and under clean cultivation, much of the soil will be lost. (Capability unit IIe–2.)

Wellston silt loam, 6 to 12 percent slopes (WeC).—Most of this soil is in wooded areas and has been protected from erosion. Its surface layers (A horizon) are about 7 to 10 inches thick in most places. Bedrock is at depths of 30 to 36 inches and restricts growth of plants. This soil should be kept in woods. If the trees are removed, erosion is potentially severe, and under clean cultivation, much of the soil will be lost. (Capability unit IIIe–2.)

Wellston silt loam, 12 to 18 percent slopes (WeD).—This soil is in woods, and very little of its original surface soil has washed away. The silt loam surface layers (A horizon) are about 7 to 10 inches thick. The depth to bedrock ranges

from 24 to 36 inches. Shallowness and the hazard of erosion restrict the use of this soil, which should be kept in permanent vegetation. (Capability unit IVe–2.)

Wellston silt loam, 12 to 18 percent slopes, moderately eroded (WeD2).—Much of the material in the original surface layers (A horizon) of this soil has washed away. Only 3 to 7 inches remains. The plow layer consists of subsoil material mixed with the remaining surface soil. Bedrock is at depths of 24 to 30 inches and restricts the kinds of plants that can be grown. To control erosion, keep this soil in permanent vegetation. (Capability unit IVe–2.)

Wellston silt loam, 18 to 25 percent slopes (WeE).—This soil has a profile like the one described for the series. The soil has been protected by trees, and 6 to 9 inches of the original surface layers (A horizon) remains. Bedrock is at depths of 24 to 30 inches. Shallowness and the hazard of erosion restrict the use of this soil to woods. (Capability unit VIe–2.)

Wellston silt loam, 18 to 25 percent slopes, moderately eroded (WeE2).—Most of the material in the original surface layers (A horizon) of this soil has washed away; only 3 to 6 inches remains. The plow layer consists mostly of subsoil material that has been mixed with the remaining surface soil. Bedrock is at depths of 24 to 30 inches, and this shallow depth restricts the kinds of plants that can be grown. Erosion must be controlled. The best uses for this soil are pasture, forest, and wildlife. (Capability unit VIe–2.)

Wellston soils, 12 to 18 percent slopes, severely eroded (WfD3).—In most places all of the material in the original surface layers (A horizon) and part of the subsoil have been lost from these soils. The depth to bedrock is only 12 to 14 inches. Fragments of shale, sandstone, and siltstone are common on the surface, especially in gullied areas. These soils contain little organic matter and are low in fertility. Pine trees are best suited to these soils. (Capability unit VIIe–2.)

Wellston soils, 18 to 25 percent slopes, severely eroded (WfE3).—These soils have lost all of the material in their original surface layers (A horizon) through erosion. In places part of the subsoil has also washed away. The depth to bedrock is 12 to 24 inches. Many fragments of sandstone, siltstone, and shale are on the surface in gullied areas. These soils contain little organic matter and are low in fertility. Because they are shallow, these soils have low moisture-supplying capacity. They have a severe hazard of further erosion. Pine trees are best suited to these soils. (Capability unit VIIe–2.)

Whitcomb Series

The Whitcomb series consists of deep, imperfectly drained, medium-textured soils on uplands. These soils are nearly level to gently sloping and occur in the eastern half of the county. They developed in loess that is underlain by weathered glacial till at depths of 12 to 30 inches. The till, in turn, is underlain by strongly acid, dark-brown to black shale at depths of 40 to 72 inches. The till contains many fragments of shale and is extremely acid. The native vegetation was trees.

These soils, in cultivated fields, have grayish-brown to brown silt loam surface layers (A horizon) that are 9 to 12 inches thick. The subsoil is light brownish-gray to gray silt loam to silty clay loam mottled with yellowish brown to strong brown. A fragipan occurs at depths of 24 to 40 inches.

The Whitcomb soils in this county have a total area of about 1 square mile. In most places they adjoin the moderately well drained Cana soils and the well drained Jennings soils. The Whitcomb soils are somewhat similar to the Avonburg soils, but they have been affected more by acid shale than those soils and are more strongly acid.

Representative profile (Whitcomb silt loam, east of a county road in northwestern corner of woods in NW¼NE¼ sec. 15, T. 3 N., R. 7 E.):

A_0 ¼ to 0 inch, partly decomposed organic matter of twigs and leaves.

A_1 0 to 4 inches, dark-brown (10YR 3/3, moist) silt loam; moderate, fine, granular structure; friable when moist; very strongly acid; 2 to 5 inches thick; boundary clear and wavy.

A_2 4 to 10 inches, brown (10YR 5/3, moist) silt loam mottled with strong brown (7.5YR 5/6, moist); mottles are common, fine, and distinct; weak, thin, platy structure; friable when moist and sticky when wet; very strongly acid; 5 to 8 inches thick; boundary clear and wavy.

B_1 10 to 13 inches, light brownish-gray (10YR 6/2, moist) silt loam mottled with yellowish brown (10YR 5/4, moist); mottles are common, fine, and faint to distinct; moderate, subangular blocky structure; firm when moist and sticky when wet; very strongly acid; 3 to 5 inches thick; boundary clear and wavy.

B_{21} 13 to 18 inches, light brownish-gray (10YR 6/2, moist) silt loam mottled with strong brown (7.5YR 5/6, moist); mottles are many, medium, and distinct; moderate, subangular blocky structure; firm when moist and slightly sticky when wet; very strongly acid; 4 to 6 inches thick; boundary abrupt and wavy.

B_{22} 18 to 28 inches, gray (10YR 6/1, moist) silt loam to light silty clay loam mottled with strong brown (7.5YR 5/6, moist); mottles are common, medium, and distinct; moderate, coarse, subangular blocky structure; firm when moist and slightly sticky when wet; very strongly acid; 10 to 12 inches thick; boundary clear and wavy.

B_{23m} 28 to 48 inches, pale-brown (10YR 6/3, moist) light silty clay loam mottled with black (10YR 2/1, moist) and dark brown (10YR 4/3, moist); moderate, medium to coarse, prismatic structure with fragipan; firm to very firm when moist; extremely acid; many weathered fragments of shale in the lower part; boundary clear and wavy.

D_r 48 inches +, bedrock of acid New Albany shale.

The thickness of the loess in which these soils developed ranges from 12 to 30 inches. The fragipan varies in density and thickness. It is 15 to 30 inches or more thick. The shale is at depths of 40 to 72 inches. Pebbles from glacial till and fragments of shale vary in amount from place to place. Surface runoff and permeability are slow. These soils are very strongly acid.

Whitcomb silt loam (Wh).—This is the only Whitcomb soil mapped in Scott County. It has a profile like the one described for the series. The surface layers (A horizon) are yellowish-brown to grayish-brown silt loam, 9 to 12 inches thick. Except for this surface layer, the entire profile is prominently mottled. Drainage is the main problem of management. Install tile lines to drain low spots, and divert water from higher areas. This soil is well suited to row crops. (Capability unit IIw–1.)

Wilbur Series

The Wilbur series consists of deep, moderately well drained, medium-textured soils on bottom lands. These

soils are nearly level to gently sloping and occur in the southwestern, south-central, and eastern parts of the county. They are developing in mixed alluvial materials that washed from soils formed in loess and in materials weathered from glacial till, sandstone, and shale. These soils are medium acid to neutral as a result of the effect of limestone or neutral parent material.

These soils have a dark-brown to dark grayish-brown silt loam surface soil. The subsoil is dark brown to dark yellowish brown and is mottled with gray and grayish brown.

The Wilbur soils in this county have a total area of about 4 square miles. In most places they adjoin the imperfectly drained Wakeland soils and the well-drained Haymond soils. They are in positions closer to the streams than the Wakeland soils and farther from the streams than the Haymond soils. They are similar to the moderately well drained Philo soils but are not so acid as those soils and are darker in color.

Representative profile (Wilbur silt loam, 0 to 2 percent slopes, 66 feet southeast of bridge abutment and south of highway in NW¼SW¼ sec. 19, T. 3 N., R. 8 E.):

A_p 0 to 8 inches, dark-brown (10YR 4/3, moist) silt loam; weak, fine, granular structure; friable when moist; neutral; 7 to 8 inches thick; boundary abrupt and smooth.

C_1 8 to 18 inches, dark-brown (10YR 4/3, moist) silt loam; weak, coarse, subangular blocky structure breaking to weak, thick, platy structure in places. Slightly firm when moist; neutral; 8 to 12 inches thick; boundary clear and wavy.

C_2 18 to 26 inches, dark-brown (10YR 4/3, moist) silt loam faintly mottled with grayish brown (10YR 5/2, moist); weak, medium, subangular blocky structure breaking to weak, medium, platy structure in places; friable when moist; neutral; 6 to 10 inches thick; boundary clear and wavy.

C_3 26 to 33 inches, dark-brown (10YR 4/3, moist) silt loam mottled with grayish brown (10YR 5/2, moist); grayish-brown to brown (10YR 5/2 to 5/3, moist) coatings on peds; weak, medium to coarse, subangular blocky structure; friable when moist; neutral; 5 to 9 inches thick; boundary clear and wavy.

C_4 33 to 42 inches, gray (10YR 6/1, moist) sandy clay loam mottled with yellowish brown (10YR 5/4, moist) and yellowish red (5YR 4/6, moist); weak, coarse, subangular blocky structure; firm when moist; neutral; 7 to 11 inches thick; boundary clear and wavy.

C_5 42 to 48 inches, gray (10YR 6/1, moist) loamy sand mottled with yellowish brown (10YR 5/4, moist) and yellowish red (5YR 4/6, moist); structureless; neutral, 6 to 12 inches thick.

C_6 48 inches +, dark-brown (10YR 4/3, moist) sand; neutral.

The Wilbur soils vary from place to place in reaction, in the thickness and color of horizons, and in the texture of the underlying parent materials. In the southwestern and south-central parts of the county the soils are medium acid to slightly acid and are underlain by fragments of sandstone, siltstone, and brown shale on top of neutral, grayish-green shale. The depth to this material is 20 to 60 inches. In the eastern part of the county, the soils are underlain by black, acid shale, limestone, and sand. Enough limestone occurs to make the soils slightly acid to neutral.

Some areas of the Wilbur soils are on low bottom lands that are frequently flooded, and some are on high bottom lands that are seldom flooded. The profiles of the soils in these two positions are somewhat similar, but the profile in the high position has developed a weak B horizon, which is missing in the profile in the low position. Also, there is coarse, stratified material at depths of 48 to 60 inches in the soils in the high positions, whereas this material is at 20 to 60 inches in soils in the low positions. Wilbur soils have slow runoff and moderate permeability.

Wilbur silt loam, 0 to 2 percent slopes (WrA).—This soil has a profile like the one described for the series. Its silt loam surface layer (A horizon) is 7 to 8 inches thick. On narrow bottom lands along small streams in the southwestern part of the county, these soils formed in silty material, less than 25 inches thick, that is underlain by fragments of shale and sandstone. In these areas this soil is distinctly mottled at depths of 15 to 20 inches, and the material is stratified and strongly cemented at depths of 30 inches. Included with this soil are a few small areas that have a sandy surface layer and one small area that has a darker colored surface soil than that described.

Overflow is the main hazard on this soil. To protect crops, divert water from uplands and provide surface drains and grassed waterways. Row crops are well suited to this soil. (Capability unit IIw–2.)

Wilbur silt loam, high bottom, 0 to 2 percent slopes (WtA).—This soil is somewhat thinner in the surface layer (A horizon) than Wilbur silt loam, 0 to 2 percent slopes, in most places. In some areas it has a yellowish-brown B horizon, which is missing in the Wilbur soils on low bottom lands. Although this soil is seldom flooded, drainage is the main problem. Tile lines and shallow surface drains are needed. This soil is suited to row crops. (Capability unit IIw–2.)

Wilbur silt loam, high bottom, 2 to 6 percent slopes (WtB).—This soil is similar to Wilbur silt loam, high bottom, 0 to 2 percent slopes. In addition to drainage, however, this soil needs protection from erosion. Provide shallow surface drainage across the slopes, and grass the waterways so that excess water can be carried away safely. Row crops are suited to this soil. (Capability unit IIw–2.)

Zanesville Series

The Zanesville series consists of moderately deep to deep, well-drained, medium-textured soils on uplands. These soils are gently sloping to steep and occur in the southeastern part of the county. They developed in leached loess that extends to depths of 18 to 48 inches. The loess is underlain by materials weathered from stratified sandstone, siltstone, and shale. The native vegetation was trees.

These soils have dark grayish-brown to yellowish-brown silt loam surface layers (A horizon). These layers are as much as 12 inches thick in some places. The subsoil is brownish-yellow silty clay loam in the upper part and has a fragipan in the lower part.

The Zanesville soils in this county have a total area of about 3½ square miles. In most places they adjoin the moderately well drained Tilsit soils and the well drained Wellston soils. The Zanesville soils are deeper to bedrock and more acid than the Wellston soils, which do not have a fragipan. They are somewhat similar to the Cincinnati soils in the lower part of the profile. The upper part, however, does not contain the glacial till material that occurs in the upper part of the Cincinnati soils.

Representative profile (Zanesville silt loam, 2 to 6 percent slopes, west of creek and north of road in NW¼NE¼NE¼ sec. 32, T. 3 N., R. 6 E.):

A_0 1 to 0 inch, moss, brush litter, and partly decomposed leaf litter.

A_1 0 to 4 inches, dark grayish-brown to brown (10YR 4/2 to 4/3, moist) silt loam; weak, fine to medium, granular structure; friable when moist; very strongly acid; 2 to 5 inches thick; boundary gradual and wavy.

A_{21} 4 to 11 inches, yellowish-brown (10YR 5/6 to 5/8, moist) silt loam; weak, fine, granular structure; friable; very strongly acid; 5 to 8 inches thick; boundary clear and wavy.

B_1 11 to 16 inches, strong-brown (7.5YR 5/6, moist) silt loam; moderate, fine, subangular blocky structure; friable when moist; very strongly acid; 4 to 6 inches thick; boundary clear and wavy.

B_{21} 16 to 30 inches, brownish-yellow (10YR 6/6, moist) light silty clay loam; moderate, fine to medium, subangular blocky structure; firm when moist; very strongly acid; 13 to 15 inches thick; boundary clear and wavy.

B_{22m} 30 to 58 inches, brown (10YR 5/3, moist) silty clay loam; peds have light-gray (10YR 7/1, moist) coatings; moderate, medium to coarse, prismatic structure; firm when moist; very strongly acid; 24 to 32 inches thick; boundary gradual and irregular.

B_{23m} 58 to 104 inches, light-gray to light brownish-gray (10YR 7/2 to 6/2, moist) clay loam splotched with yellowish red (5YR 5/8); moderate to weak, very coarse, prismatic structure; very firm when moist; very strongly acid; 44 to 48 inches thick; boundary gradual and wavy.

C 104 to 120 inches, light brownish-gray (10YR 6/2, moist) and strong-brown (7.5YR 5/6, moist) silty clay loam; moderate, coarse, subangular blocky structure.

D 120 inches +, stratified layers of partly weathered sandstone and shale of Borden formation; strongly acid.

The loess in which these soils developed is 18 to 48 inches thick. The fragipan is at variable depths. It formed entirely in loess, entirely in material weathered from bedrock, or partly in loess and partly in the weathered material. Stratified sandstone and shale are at depths of 5 to 12 feet. The profile described is exceptionally deep.

If these soils have not been limed, they are very strongly acid. Runoff is medium to rapid, and the permeability is moderate.

Zanesville silt loam, 2 to 6 percent slopes, moderately eroded (ZaB2).—This soil has a profile like the one described for the series. The surface layers (A horizon) are 5 to 9 inches thick in cultivated fields where erosion has been active, but in narrow, wooded areas they are as much as 12 inches or more thick. This soil is well suited to row crops if erosion is controlled. For protection early in spring and during the growing season, it needs to be stripcropped and terraced. For winter protection, plant cover crops and spread cornstalks on the surface. (Capability unit IIe–1.)

Zanesville silt loam, 6 to 12 percent slopes (ZaC).—This soil is in wooded areas and has been protected from erosion. The surface layers (A horizon) are 8 to 12 inches thick, and the depth to bedrock is 6 to 7 feet. If this soil is cleared, control of erosion is necessary. Protect the soil by terracing and tilling on the contour. Plow under plant residue to improve tilth. Row crops are suited to this soil. (Capability unit IIIe–1.)

Zanesville silt loam, 6 to 12 percent slopes, moderately eroded (ZaC2).—All except 3 to 8 inches of the material in the original surface layers (A horizon) of this soil has washed away in most places. In a few areas, galled spots occur. Here, all the material in the surface layer has been lost and the yellowish-brown silty clay loam subsoil is exposed. In most places, the plow layer now consists of the remaining surface soil in which a small amount of subsoil material has been mixed. Erosion is the main problem. Improve tilth by adding plant residue, and plant legume-and-grass mixtures on this soil. (Capability unit IIIe–1.)

Zanesville silt loam, 12 to 18 percent slopes (ZaD).—Most of this soil is in woods and has been protected from erosion. Its brown silt loam surface layers (A horizon) are 8 to 12 inches thick. The profile is similar to the one described for the series. Because of the hazard of erosion, meadow, permanent pasture, and trees are the best uses. (Capability unit IVe–2.)

Zanesville silt loam, 12 to 18 percent slopes, moderately eroded (ZaD2).—This soil is more severely eroded than Zanesville silt loam, 12 to 18 percent slopes, and is thinner in the surface soil. In most places all except 3 to 8 inches of the material in the original surface layers (A horizon) has washed away. In a few places all of the material in the surface layers has been lost and yellowish-brown spots occur. Erosion is a hazard. Most of this soil has been reforested to Virginia pine and is best suited to that use. (Capability unit IVe–2.)

Zanesville silt loam, 18 to 25 percent slopes (ZaE).—This soil is in wooded areas that have received some protection from erosion. The surface layers (A horizon) are 8 to 12 inches thick. The depth to bedrock is 4 to 6 feet. Erosion is a serious hazard, and this soil should remain in permanent vegetation. (Capability unit VIe–2.)

Zanesville soils, 6 to 12 percent slopes, severely eroded (ZsC3).—In most places this soil has lost all of the material in its original surface layers (A horizon). The plow layer consists mostly of subsoil material. It contains little organic matter and is low in plant nutrients. Erosion is a serious problem. Permanent pasture, meadow, or pine Christmas trees are best suited to this soil. (Capability unit IVe–1.)

Zanesville soils, 12 to 18 percent slopes, severely eroded (ZsD3).—In most places this soil has lost all of the material in the original surface layers (A horizon) and part of the subsoil. Many fragments of sandstone and shale are on the surface, and a few areas are gullied. Because erosion is a serious problem, this soil needs to be kept in permanent vegetation. (Capability unit VIe–1.)

Zanesville soils, 18 to 25 percent slopes, severely eroded (ZsE3).—This soil is gullied in most places. Between the gullies in some places, 2 to 3 inches of the material in the original surface layers (A horizon) remains. Many fragments of sandstone and shale are on the surface. Erosion is a serious problem, and this soil is best suited to pine trees. (Capability unit VIIe–2.)

Use and Management of Soils

This section consists of five main parts. In the first part, the nationwide system of capability classification is explained and the soils of the county are placed in capability units, or management groups, and use and management are described. The second part lists estimated yields of the main crops in the county. The third part

discusses the management of soils when used for vegetables and special crops. The fourth part tells what should be done before fields are irrigated. The fifth part discusses wildlife management.

Capability Groups of Soils

The capability classification is a grouping of soils that shows, in a general way, how suitable the soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to management.

In this system all the kinds of soils are grouped at three levels, the capability class, subclass, and unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils of the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, grazing, or wood products. Scott County has no soils in class VIII.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be as many as four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in this class have little or no erosion hazard but have other limitations that restrict their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping of soils for the many statements about their management. Capability units are generally identified by numbers assigned locally, for example, IIe-1 or IIIe-2.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of permanent limitation of the soils. Not considered in this classification are major and generally expensive land-forming that would change slope, depth, or other characteristics of the soil and possible but unlikely major reclamation projects.

Following are the capability classes, subclasses, and units in Scott County and a brief description of the soils in these groups.

Class I.—Soils that have few limitations in use.
- Unit I-1: Moderately deep to deep, moderately well drained, nearly level soils on uplands; little or no hazard of erosion or droughtiness; high moisture-supplying capacity.
- Unit I-2: Deep, nearly level to gently sloping, well-drained soils on bottom lands that are sometimes flooded; little or no hazard of erosion or droughtiness; high moisture-supplying capacity.

Class II.—Soils moderately limited for use as cropland.
- Subclass IIe: Soils subject to erosion if cover is not maintained.
  - Unit IIe-1: Moderately deep to deep, gently sloping, moderately well drained to well drained soils on uplands and stream terraces; high moisture-supplying capacity.
  - Unit IIe-2: Moderately deep, gently sloping, well drained to moderately well drained soils on uplands; moderate risk of erosion; fairly high moisture-supplying capacity.
- Subclass IIw: Moderately wet soils.
  - Unit IIw-1: Moderately deep to deep, nearly level to gently sloping, imperfectly drained soils on uplands and stream terraces; little to moderate risk of erosion; high moisture-supplying capacity.
  - Unit IIw-2: Deep, nearly level to gently sloping, imperfectly drained to moderately well drained soils on bottom lands that are sometimes flooded; little or no risk of erosion; high moisture-supplying capacity.

Class III.—Soils severely limited but suitable for regular use for crops.
- Subclass IIIe: Soils that have high risk of erosion if tilled.
  - Unit IIIe-1: Deep, moderately sloping, well drained to moderately well drained soils on uplands and stream terraces; high risk of erosion; fairly high moisture-supplying capacity.
  - Unit IIIe-2: Moderately deep, moderately sloping, well drained to moderately well drained soils on uplands; high risk of erosion; low moisture-supplying capacity.
- Subclass IIIw: Wet soils that require artificial drainage if tilled.
  - Unit IIIw-1: Deep, nearly level, poorly drained soils on uplands and terraces; little or no risk of erosion; high moisture-supplying capacity.

Class IV.—Soils very severely limited in use for crops but suitable for cultivation if very carefully managed, or suitable for special crops.
- Subclass IVe: Soils severely limited by erosion if cover is not maintained.
  - Unit IVe-1: Deep to moderately deep, gently sloping to moderately steep, well drained to moderately well drained soils on uplands and terraces; high risk of erosion; fairly high moisture-supplying capacity.
  - Unit IVe-2: Deep to moderately deep, strongly sloping, well drained soils on uplands and terraces; high risk of erosion; fairly low to low moisture-supplying capacity.

Class V.—Soils that have little or no risk of erosion but that have other limitations that restrict their use largely to pasture, woodland, or wildlife.
- Subclass Vw: Wet soils not suited to crops.
  - Unit Vw-1: Deep, nearly level, poorly drained soil on bottom lands that are sometimes

flooded; little or no risk of erosion; very high moisture-supplying capacity.

Class VI.—Soils that have severe limitations that make them generally unsuited to cultivation and that restrict their use largely to pasture, woodland, or wildlife.

Subclass VIe: Soils moderately limited for pasture or trees because of erosion.

Unit VIe–1: Moderately deep to deep, moderately steep, well-drained soils on uplands and terraces; high risk of erosion; fairly low to low moisture-supplying capacity.

Unit VIe–2: Moderately deep to deep, moderately steep to steep, well-drained soils on uplands and terraces; high risk of erosion; fairly low to low moisture-supplying capacity.

Class VII.—Soils that have very severe limitations that make them unsuitable for cultivation and restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe: Soils severely limited by risk of erosion if cover is not maintained.

Unit VIIe–1: Shallow to deep, moderately steep to steep, well drained to excessively drained soils on uplands; high risk of erosion; fairly low to low moisture-supplying capacity.

Unit VIIe–2: Shallow to deep, moderately steep, well drained to excessively drained, severely eroded soils on uplands and terraces, and badly gullied land; very high risk of erosion; low moisture-supplying capacity.

Unit VIIe–3: Shallow to deep, moderately steep to very steep, moderately well drained to excessively drained soils on uplands; very high risk of erosion; low moisture-supplying capacity.

Management by capability units

The soils of Scott County have been placed in 17 capability units, or management groups. The soils in any one unit need about the same kind of management, respond to management in about the same way, and have essentially the same limitations.

In the discussion of the capability units, the soils in a unit are described as a group and then they are listed. Following this list are statements on use and management. In one paragraph a basic cropping system without mechanical practices is suggested for the unit. Other systems that can be used where the soils are contoured, stripcropped, or terraced are also suggested for some units.

Amendments needed by the soils in the unit are listed. The suggested amounts of fertilizer and rates of application are based on the average fertility of the soils in Scott County, as indicated by soil tests made at Purdue University from 1953 to 1954. Three-fourths of the soils tested were low to very low in phosphate and potash. Because soils on only about 5 percent of the farms in the county were tested, the suggested amounts of fertilizer and rates of application can be used only as general guides. You should have your soils tested before applying fertilizer, particularly if you fertilize for higher than average yields.

The tests made at Purdue University indicate that most soils in the county are medium to low in fertility. Therefore, the suggested fertilization is for soils in the medium to low range. Soils that have been fertilized regularly for long periods probably need smaller amounts of fertilizer than those suggested.

For most capability units, fertilization is suggested for improved management and for common, or prevailing, management. Under improved management, yields of 85 to 100 bushels of corn are expected on deep, nearly level soils that have high moisture-supplying capacity. No supplemental irrigation is needed. You can increase yields of corn by increasing the amount of nitrogen added during the second and third successive year that the corn is grown.

Under common management, yields of 60 to 80 bushels of corn per acre are expected on deep, nearly level soils that have high moisture-supplying capacity. If corn is to be grown for 2 or 3 successive years, it should be confined to level bottom lands or gently sloping uplands.

Factors other than fertilization that are considered for the two levels of management are given in the subsection "Estimated Yields."

CAPABILITY UNIT I–1

This capability unit consists of moderately deep to deep, moderately well drained soils on nearly level uplands. These soils have surface layers, 10 to 12 inches thick, that absorb water well. The soils in this unit are:

Cana silt loam, 0 to 2 percent slopes.
Rossmoyne silt loam, 0 to 2 percent slopes.
Tilsit silt loam, 0 to 2 percent slopes.

For the most part, these soils are in crops and pasture. A small acreage is in woods, and a very small acreage is in permanent pasture. If these soils are managed carefully and are tilled on the contour, erosion is no problem.

Cropping systems.—A safe, basic cropping system under common management is 2 years of row crops, a small grain, and 2 years of meadow. The row crops can be grown for 3 years if management is improved to provide additional nitrogen to supplement that fixed by legumes in the meadow. Also to improve management, return crop residue to the soils and plant a cover crop after the row crop is harvested. The cover crop reduces soil losses late in winter and early in spring. Contour tillage may reduce soil loss on the most sloping areas of these soils in spring and save moisture for use in summer.

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit I–1 at two levels of management:

	Improved management	*Common management*
Nitrogen	For corn, 40 pounds first year and 120 pounds second and third years.	For corn, starter nitrogen first year and 80 pounds second year.
	For wheat, 40 pounds.	For wheat, 30 pounds.
Phosphate (P_2O_5)	50 pounds	40 pounds.
Potash (K_2O)	80 pounds	60 pounds.

If soybeans are grown, apply phosphate and potash in amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT I-2

This capability unit consists of moderately deep to deep, nearly level to gently sloping, well-drained soils on bottom lands. These soils are likely to be flooded occasionally. The slopes of these soils break sharply in a few narrow areas. Generally, sloping areas of these soils need the same management as the more level areas. The soils in this unit are:

Haymond silt loam, 0 to 2 percent slopes.
Haymond silt loam, 2 to 6 percent slopes.
Haymond silt loam, high bottom, 0 to 2 percent slopes.
Haymond silt loam, high bottom, 2 to 6 percent slopes.
Pope silt loam.

Since these soils are flooded occasionally, they are generally planted to continuous row crops. Winter cover crops, however, can be grown on the better drained parts of the flood plains where water recedes quickly. Natural dikes border the stream channels in some areas and are well suited to crops because they drain quickly after they are flooded. The Haymond soils on high bottoms are seldom flooded.

Except for local scouring on narrow, sloping areas, little soil is lost through erosion. Sandy material deposited by floodwaters damages these soils more than erosion. To control floods, keep a strip of timber along banks of large streams, build levees to protect areas on the broad bottom lands, and protect the lower areas by planting rye, ryegrass, or other drilled crops.

Cropping systems.—Row crops are well suited to these soils. The row crops can be grown continuously under improved management if crop residue is returned to the soils. In areas suited to grain and meadow, you can plant a grain and legume intercrop after 2 or 3 years of row crops. The legume supplies nitrogen to the soils. Alfalfa is a suitable legume (fig. 8).

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Nitrogen fertilizer must be applied liberally to the corn crop to supplement the nitrogen normally supplied by the legume. Handle crop residue so that a maximum amount of it can be plowed into the soils. Grow cover crops as often as possible between successive row crops to lessen the loss of fertility through leaching.

Figure 8.—A partly mowed stand of alfalfa on class I soil.

Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 1 ton of lime or less per acre every 6 to 8 years. The Pope soils in this group need about 3 tons of lime every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit I-2 at two levels of management:

	Improved management	*Common management*
Nitrogen	For corn following a legume, 60 pounds first year and 120 pounds second and third years. For wheat, 40 pounds.	For corn following a legume, 40 pounds first year and 80 pounds second and third years. For wheat, 30 pounds.
Phosphate (P_2O_5)	35 pounds	25 pounds.
Potash (K_2O)	50 pounds	40 pounds.

If soybeans are grown, apply phosphate and potash in the amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT IIe-1

The soils in this capability unit are moderately deep to deep and moderately well drained to well drained. These soils are on gentle slopes on uplands and stream terraces. They are medium acid to strongly acid and are low in organic matter and natural fertility. Their moisture-supplying capacity is high. Most of these soils have a silt loam surface layer only 5 or 6 inches thick, because much of the soil material has washed away. These thinner soils have greater surface runoff than the soils in this group that have surface layers 8 to 10 inches thick. The soils in capability unit IIe-1 are:

Cana silt loam, 2 to 6 percent slopes.
Cana silt loam, 2 to 6 percent slopes, moderately eroded.
Cincinnati silt loam, 2 to 6 percent slopes.
Cincinnati silt loam, 2 to 6 percent slopes, moderately eroded.
Grayford silt loam, 2 to 6 percent slopes.
Grayford silt loam, 2 to 6 percent slopes, moderately eroded.
Haubstadt silt loam, 2 to 6 percent slopes.
Haubstadt silt loam, 2 to 6 percent slopes, moderately eroded.
Jennings silt loam, 2 to 6 percent slopes.
Jennings silt loam, 2 to 6 percent slopes, moderately eroded.
Jennings silt loam, heavy substratum, 2 to 6 percent slopes.
Jennings silt loam, heavy substratum, 2 to 6 percent slopes, moderately eroded.
Otwell silt loam, 2 to 6 percent slopes.
Parke silt loam, 2 to 6 percent slopes, moderately eroded.
Rossmoyne silt loam, 2 to 6 percent slopes.
Rossmoyne silt loam, 2 to 6 percent slopes, moderately eroded.
Tilsit silt loam, 2 to 6 percent slopes.
Tilsit silt loam, 2 to 6 percent slopes, moderately eroded.
Zanesville silt loam, 2 to 6 percent slopes, moderately eroded.

Most of the acreage of these soils is in crops and pasture, but some is in pastured woods or brush. Clean-tilled fields on the sloping parts of croplands are likely to erode during short rains and in open winters when there is little protection from snow. If these soils are managed carefully, erosion is not a serious problem. To help control erosion, till on the contour and divert excess water from higher areas. For protection in winter and early in spring, return crop residue to the soils and plant cover crops.

Cropping systems.—Without contour tillage or other practices to prevent erosion and conserve water, a safe basic cropping system consists of a row crop for 1 year, a small grain for 1 year, and meadow for 3 years. Row crops and grain can be grown more frequently if tillage

is on the contour. If these soils are stripcropped and terraced, a safe cropping system is 2 years of row crops, 1 year of a small grain, and 2 years of meadow.

In the past few years, these soils have been highly fertilized and the yield of corn has increased so that much residue is available. If this residue is returned to the soil for protection in winter and spring, you may be able to produce a third year of corn in the cropping system. Watch your soil losses and the condition of your crops to tell how well your cropping system is working.

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IIe-1 at two levels of management:

	Improved management	*Common management*
Nitrogen	For corn, 40 pounds first year and 120 pounds second year.	For corn, only starter fertilizer first year and 80 pounds second year.
	For wheat, 40 pounds.	For wheat, 30 pounds.
Phosphate (P_2O_5)	50 pounds	40 pounds.
Potash (K_2O)	90 pounds	70 pounds.

If soybeans are grown, apply phosphate and potash in the amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT IIe-2

This capability unit consists of gently sloping, moderately deep, well drained to moderately well drained soils on uplands. Bedrock is at depths of 20 to 40 inches. These soils are more erodible and have a lower moisture-holding capacity than the soils in capability unit IIe-1 but are similar to the soils in that unit in other respects. The soils in unit IIe-2 are strongly acid and are low in organic matter and natural fertility. Their surface soil varies in thickness. The soils in this unit are:

- Trappist silt loam, 2 to 6 percent slopes.
- Trappist silt loam, 2 to 6 percent slopes, moderately eroded.
- Trappist silt loam, moderately well drained, 2 to 6 percent slopes.
- Trappist silt loam, moderately well drained, 2 to 6 percent slopes, moderately eroded.
- Wellston silt loam, 2 to 6 percent slopes.

Most of the acreage of these soils has been cleared and is in farms. Many areas that were formerly in crops are now in pasture and brushy timber. Erosion is the main problem. Because of their position on narrow, knife-edge ridges, the Wellston soil erodes readily. The Trappist soils are also susceptible to erosion, for they have a shaly, slowly permeable substratum.

Cropping systems.—A safe, basic cropping system without mechanical practices on these soils consists of a row crop for 1 year, a small grain for 1 year, and meadow for 3 years. If these soils are tilled on the contour, the small grain can be grown for 2 years after a row crop and only 2 years of meadow is needed. If the soils are stripcropped and terraced, a suitable cropping system is 2 years of row crops, 1 year of a small grain, and 2 years of meadow. To control erosion, return crop residue to the soils and plant a cover crop after the row crop is harvested. In some places, water can be diverted from higher areas to keep these soils from washing away.

Amendments needed. These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 or 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IIe-2 at two levels of management:

	Improved management	*Common management*
Nitrogen	For corn, 20 pounds first year and 80 pounds second year.	For corn, starter nitrogen first year and 60 pounds second year.
	For wheat, 30 pounds.	For wheat, 30 pounds.
Phosphate (P_2O_5)	40 pounds	30 pounds.
Potash (K_2O)	70 pounds	50 pounds.

If soybeans are grown, apply phosphate and potash in the amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT IIw-1

This capability unit consists of nearly level to gently sloping, moderately deep to deep, imperfectly drained soils. Most of these soils are on uplands and stream terraces. They have gray surface layers that are 10 to 12 inches thick in most places, but in small areas all except 5 or 6 inches of the surface layers has washed away. At depths of 24 to 40 inches, a compact layer restricts the penetration of roots and the movement of water. In wet seasons crops are damaged by excess water. The moisture-supplying capacity is high. These soils are naturally low in organic matter and fertility and are strongly acid. They warm up slowly in spring. The soils in this unit are:

- Avonburg silt loam, 0 to 2 percent slopes.
- Avonburg silt loam, 2 to 6 percent slopes.
- Avonburg silt loam, 2 to 6 percent slopes, moderately eroded.
- Dubois silt loam, 0 to 2 percent slopes.
- Dubois silt loam, 2 to 6 percent slopes.
- Dubois silt loam, 2 to 6 percent slopes, moderately eroded.
- Johnsburg silt loam.
- Whitcomb silt loam.

Most of the acreage of these soils is in crops, but some is in cutover forest. The more poorly drained areas are in unimproved pasture containing broomsedge and briers. If they are drained and well managed, these soils are among the most productive in the county and erosion is no problem. Less than 5 percent of the total acreage is eroded. Wetness is the main hazard on these soils. Surface drainage and, in low spots, tile lines are generally adequate to drain these soils. Extend the ditches across the slopes. In some places water from higher areas needs to be diverted through grassed waterways.

Cropping systems.—If drainage is adequate, a safe, basic cropping system is 2 years of row crops, 1 year of a small grain, and 2 years of meadow. On gentle slopes or where the surface soil is thin, 2 years of meadow instead of 1 year is safer. Under improved management, the row crops can be grown for as many as 3 years. This management, however, should provide intensive use of crop residue in sloping areas to protect the soils in winter and early in spring and to maintain organic matter. Plant a winter cover crop to reduce loss of soil and the

leaching of plant nutrients. The cover crop also keeps the soils productive and helps maintain their structure. To improve tilth, plow under the cover crop in spring. For the first few years, these soils respond especially well to nitrogen fertilizer and barnyard manure for all grain crops.

Amendments needed.—These soils should be tested to determine the need for additions of lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IIw-1 at two levels of management:

	Improved management	*Common management*
Nitrogen	For corn, 40 pounds first year and 120 pounds second and third years.	For corn, starter nitrogen first year and 80 pounds second year.
	For wheat, 40 pounds.	For wheat, 30 pounds.
Phosphate (P_2O_5)	50 pounds	40 pounds.
Potash (K_2O)	80 pounds	60 pounds.

If soybeans are grown, apply phosphate and potash in amounts listed but apply nitrogen only as a starter fertilizer.

If your soils cannot be adequately drained, it is probably better to apply fertilizer at the rate suggested for average management.

CAPABILITY UNIT IIw-2

This capability unit consists of deep, nearly level to gently sloping, imperfectly drained to moderately well drained soils on bottom lands. In many places these soils are in long troughs on the upper part of the bottom lands. At times the streams overflow, and standing water is a hazard. These soils are slightly acid to strongly acid and are moderately fertile. Their moisture-supplying capacity is high. If artificially drained, they are productive. The soils in this unit are:

Philo silt loam, 0 to 2 percent slopes.
Philo silt loam, 2 to 6 percent slopes.
Stendal silt loam.
Wakeland silt loam.
Wilbur silt loam, 0 to 2 percent slopes.
Wilbur silt loam, high bottom, 0 to 2 percent slopes.
Wilbur silt loam, high bottom, 2 to 6 percent slopes.

Most of the acreage of these soils is in crops, but the more poorly drained areas are in forest. Except for local scouring near stream bends and meanders, little soil is lost through erosion. Standing floodwaters, however, cause the most damage. The slow drainage in the subsoil restricts the movement of water through these soils. To drain off excess water, install shallow surface drains and graded waterways. These surface drains can be at random or parallel to one another. Where good outlets are available, tile laid at random or regularly spaced is useful (fig. 9). Divert water from the uplands and build levees along the streams. A strip of timber left standing along the large streams reduces cutting in the streambanks.

Cropping systems.—Under improved management, these soils are suited to row crops grown continuously. Unless good drainage is provided, the soils are too wet for small grain. Drained areas that are mostly free from floods are suited to a cropping system that provides 1 year of a small grain and a legume intercrop following 2 or 3 years of row crops.

Figure 9.—**Tile lines are installed to drain the soils on bottom lands that are flooded.**

Nitrogen fertilizer should be applied liberally to supplement that produced by the legume. Preserve crop residue so that a maximum amount can be plowed into these soils, and plant cover crops to decrease loss of fertility through leaching. Let crop yields be your guide in deciding how well your cropping system is working.

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, the Wilbur and Wakeland soils in this unit may need an application of about 1 ton of lime per acre every 6 to 8 years. The Philo and Stendal soils need about 3 tons in as many years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IIw-2 at two levels of management. If drainage is not adequate, it may be better to use the amounts of fertilizer suggested for common management.

	Improved management	*Common management*
Nitrogen	For corn following a legume, 60 pounds first year and 120 pounds second and third years.	For corn, 60 to 80 pounds first, second, and third years.
	For corn not following a legume, 120 pounds first, second, and third years.	
	For wheat, 40 pounds.	
Phosphate (P_2O_5)	35 pounds	25 pounds.
Potash (K_2O)	50 pounds	40 pounds.

If soybeans are grown, apply phosphate and potash in amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT IIIe-1

This capability unit consists of deep, moderately sloping, well drained to moderately well drained soils on uplands and stream terraces. In about 30 percent of these soils, the surface layer is 8 or 9 inches thick. The moderately

eroded soils, in contrast, are only 5 or 6 inches thick. The soils in this unit are strongly acid, contain little organic matter, and are low in plant nutrients. Their moisture-supplying capacity is fairly high. They are:

Cincinnati silt loam, 6 to 12 percent slopes.
Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded.
Grayford silt loam, 6 to 12 percent slopes, moderately eroded.
Jennings silt loam, 6 to 12 percent slopes.
Jennings silt loam, 6 to 12 percent slopes, moderately eroded.
Jennings silt loam, heavy substratum, 6 to 12 percent slopes.
Jennings silt loam, heavy substratum, 6 to 12 percent slopes, moderately eroded.
Jennings silt loam, mixed substratum, 6 to 12 percent slopes.
Jennings silt loam, mixed substratum, 6 to 12 percent slopes, moderately eroded.
Otwell silt loam, 6 to 12 percent slopes, moderately eroded.
Parke silt loam, 6 to 12 percent slopes, moderately eroded.
Rossmoyne silt loam, 6 to 12 percent slopes, moderately eroded.
Zanesville silt loam, 6 to 12 percent slopes.
Zanesville silt loam, 6 to 12 percent slopes, moderately eroded.

Most of the acreage of these soils is in crops, but much is in cutover hardwoods, unimproved pasture, and pasture grown in a cropping system with other plants. These moderately sloping soils erode easily unless protected by vegetation. To control erosion and conserve water and soil, divert water from higher areas (fig. 10) and till on the contour. Protect these soils in winter by crop residue, or plant a cover crop.

Cropping systems.—If contour tillage or other practices to conserve soil and water are not provided, a safe, basic cropping system on these soils is 1 year of a small grain and 3 years of meadow. If tillage is on the contour, a row crop can precede the small grain. If stripcropping is provided, you can plant a row crop, a small grain for 2 years, and meadow for 2 years. On slopes greater than 9 percent, a safer system is 1 year of a row crop, 1 year of a small grain, and 3 years of meadow.

If these soils are terraced and tilled on the contour, 2 years of row crops can be grown in 5 years, provided the cropping system includes 1 year of a small grain and 2 years of meadow. On the steeper slopes, plant only 1 year of a row crop in this system. Even with terracing and contouring, it is difficult to produce continuous row crops on these soils. Watch your fields carefully for signs of erosion (fig. 11), provide improved management, and make intensive use of crop residue.

***Figure 10.*—Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded. In the foreground, sod waterway to lead excess water from higher ground; in background, soils on terraces.**

***Figure 11.*—Jennings silt loam, 6 to 12 percent slopes, moderately eroded, on a slope of 10 percent. Gullies have formed along the rows during one rain because this soil was plowed parallel to the slope instead of on the contour.**

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IIIe–1 at two levels of management.

	Improved management	*Common management*
Nitrogen	For corn, 40 pounds first year and 120 pounds second year.	For corn, only starter nitrogen first year.
	For wheat, 40 pounds.	For wheat, 30 pounds.
Phosphate (P_2O_5)	50 pounds	40 pounds.
Potash (K_2O)	80 to 90 pounds	60 pounds.

If soybeans are grown, apply phosphate and potash in amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT IIIe-2

This capability unit consists of moderately deep, moderately sloping, well drained to moderately well drained soils on uplands. These soils have less moisture-supplying capacity than the soils in capability unit IIIe–1. Bedrock of shale or mixed sandstone and shale slows the movement of water through these soils, which are saturated in wet seasons and droughty in dry seasons. Runoff is rapid, and many areas are eroded to the extent that the surface layer is only 3 to 6 inches thick. These areas normally produce lower yields than the uneroded areas. These soils are strongly acid, contain little organic matter, and are low in plant nutrients. They have low moisture-supplying capacity. They are:

Trappist silt loam, 6 to 12 percent slopes.
Trappist silt loam, 6 to 12 percent slopes, moderately eroded.
Wellston silt loam, 6 to 12 percent slopes.

Most of the acreage of these soils is in pasture, meadow, or trees. A few areas are planted to row crops or to pasture grown in a cropping system with other plants. If planted to row crops, these soils require contour culti-

vation because they erode readily. To prevent loss of soil, protect the acreage by vegetation or by plant residue at all times and maintain a cover crop in winter.

Cropping systems.—Unless management includes practices to conserve water and protect the soil, row crops cannot be safely grown. A safe, basic cropping system consists of a small grain for 1 year and meadow for 3 years. Slopes greater than 9 percent should be reseeded to grass.

If these soils are stripcropped, areas on the mild slopes are suited to a cropping system that consists of row crops for 1 year, grain for 1 year, and meadow for 2 years. In steeper areas 1 year of a small grain and 3 years of meadow is more suitable. On terraced, uneroded soils with slopes less than 9 percent, it is safe to grow row crops for 2 years if they are followed by 1 year of a small grain and 2 years of meadow.

On the more eroded, stronger slopes, terrace the soils and use a less intensive cropping system. A suitable system is 1 year of row crops, 1 year of grain, and 3 years of meadow. Let crop yields and signs of further erosion show you how well your system is working.

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

These soils should be fertilized at a lower rate than the soils in unit IIIe-1 because they are shallower and more droughty. Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IIIe-2 at two levels of management.

	Improved management	*Common management*
Nitrogen	For corn, 20 pounds. For wheat, 30 pounds.	For corn, starter nitrogen only.
Phosphate (P_2O_5)	40 pounds	30 pounds.
Potash (K_2O)	70 pounds	50 pounds.

If soybeans are grown, apply phosphate and potash in amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT IIIw-1

This capability unit consists of deep, nearly level, poorly drained soils on uplands and terraces. Because these soils are almost flat, natural surface drainage is very slow and, in places, low spots are ponded in wet seasons. These soils occur in areas called slash lands. Poor drainage makes them very gray in color. They have high moisture-supplying capacity. They contain little organic matter and are low in plant nutrients, but they respond to applications of fertilizer and other good management. The soils in this unit are:

Clermont silt loam.
Robinson silt loam.

Most of the acreage of these soils is in corn, small grains, and meadow. The most nearly level areas, which are difficult to drain, are used for woodlots. Except in local spots around heads of drainageways, these soils do not erode badly. Before planting crops, however, carefully level the surface and fill in slight depressions. Tile systems, without surface drainage, generally are not sufficient to drain these soils in wet seasons. Dig ditches across the slopes for surface drainage. Drainage can also be improved by tile laid along the edges of waterways and laid at random in low spots where outlets are available. The drainage system must be planned and installed carefully so that grades are steep enough to move the water across the surface or through tile lines.

Cropping systems.—Row crops are well suited to the soils in this capability unit. A good, basic cropping system provides row crops for 2 years, a small grain for 1 year, and meadow for 1 year. If drainage is adequate and if management is improved, 3 years of row crops can be grown between the meadow crops. Plant green-manure crops from time to time to increase organic matter. Let crop yields and signs of erosion help you determine how well your system is working.

Amendments needed.—These soils should be tested to determine the need for additions of lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IIIw-1 at two levels of management. If drainage is not adequate, it may be better to use the amounts of fertilizer suggested for common management.

	Improved management	*Common management*
Nitrogen	For corn, 40 pounds first year and 120 pounds second and third years. For wheat, 40 pounds.	For corn, 20 pounds first year and 80 pounds second year. For wheat, 30 pounds.
Phosphate (P_2O_5)	50 pounds	40 pounds.
Potash (K_2O)	80 pounds	60 pounds.

If soybeans are grown, apply phosphate and potash in amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT IVe-1

This capability unit consists of gently sloping to moderately steep, deep to moderately deep, well drained to moderately well drained soils on uplands and terraces. In most places these soils are so eroded that the subsoil is exposed and gullies have formed (fig. 12). In these places the average thickness of the surface layer is not more than 3 inches. The soils in this unit are strongly

***Figure 12.*—In background, Cincinnati soils, 6 to 12 percent slopes, severely eroded; in foreground, cattle grazing on Stendal silt loam.**

acid and are low in organic matter and fertility. They have fairly high moisture-supplying capacity. They are:

Cana soils, 2 to 6 percent slopes, severely eroded.
Cincinnati soils, 6 to 12 percent slopes, severely eroded.
Grayford soils, 6 to 12 percent slopes, severely eroded.
Haubstadt soils, 2 to 6 percent slopes, severely eroded.
Jennings soils, 2 to 6 percent slopes, severely eroded.
Jennings soils, 6 to 12 percent slopes, severely eroded.
Jennings soils, mixed substratum, 6 to 12 percent slopes, severely eroded.
Jennings soils, heavy substratum, 6 to 12 percent slopes, severely eroded.
Otwell soils, 6 to 12 percent slopes, severely eroded.
Parke soils, 6 to 12 percent slopes, severely eroded.
Rossmoyne soils, 2 to 6 percent slopes, severely eroded.
Rossmoyne soils, 6 to 12 percent slopes, severely eroded.
Zanesville soils, 6 to 12 percent slopes, severely eroded.

Most of the acreage of these soils is in unproductive broomsedge or brushy pasture. The soils on gentle slopes are in crops or improved pasture. All of the soils in this unit have formerly been cropped, but they are no longer suited to heavy cropping. Their best use is probably permanent pasture, meadow, or pine Christmas trees. These soils absorb water poorly and continue to erode if not well covered by vegetation. To prevent further loss of soil, divert water from higher areas and keep crop residue on the soils in winter and early in spring.

Cropping systems.—If there are no soil- and water-control measures, row crops can be grown safely only on the gentle slopes. The best cropping system is probably 1 year of a small grain and 3 years of meadow. If the gentle slopes are tilled on the contour, a suitable cropping system is 1 year of a row crop, 1 year of a small grain, and 2 years of meadow.

If these soils are tilled on the contour and stripcropped, a row crop can be grown on the steeper slopes for 1 year if followed by 1 year of a small grain and 3 years of meadow. On the gentle slopes under stripcropping and contour tillage, row crops can be grown for 2 years in a cropping system that includes 1 year of a small grain and 2 years of meadow.

Amendments needed.—These soils should be tested to determine the need for additions of lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

Because these soils are severely eroded and are droughty in summer, yields are lower than on the better soils in the county and the soils respond less to amendments. Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IVe–1 under improved management.

	Improved management
Nitrogen	For corn, 20 pounds first year and, on gentle slopes where corn is grown 2 years, 80 pounds second year. For wheat, 40 pounds.
Phosphate (P_2O_5)	120 pounds plowed down before planting and 40 pounds each year.
Potash (K_2O)	60 pounds plowed down before planting and 80 pounds each year.

Plant fescue or another permanent grass in areas of these soils that are better suited to pasture than to row crops and small grain. To establish pasture, at planting time apply, per acre, 40 pounds of nitrogen, 100 to 120 pounds of phosphate, and 60 pounds of potash. Yearly thereafter add 100 pounds of nitrogen, in split applications; 30 pounds of phosphate; and 40 pounds of potash.

CAPABILITY UNIT IVe-2

This capability unit consists of deep to moderately deep, well-drained soils on strong slopes on uplands and terraces. The slopes are so steep that runoff is rapid and the soils cannot absorb enough rainfall to supply the needs of plants. The soils are normally strongly acid, contain little organic matter, and are low in plant nutrients. They are droughty in summer. The moderately eroded soils in this unit have a silt loam surface layer that averages 5 to 6 inches in thickness. The soils in this unit are:

Cincinnati silt loam, 12 to 18 percent slopes.
Cincinnati silt loam, 12 to 18 percent slopes, moderately eroded.
Grayford silt loam, 12 to 18 percent slopes, moderately eroded.
Jennings silt loam, 12 to 18 percent slopes.
Jennings silt loam, 12 to 18 percent slopes, moderately eroded.
Jennings silt loam, heavy substratum, 12 to 18 percent slopes.
Jennings silt loam, heavy substratum, 12 to 18 percent slopes, moderately eroded.
Jennings silt loam, mixed substratum, 12 to 18 percent slopes.
Otwell silt loam, 12 to 18 percent slopes.
Parke silt loam, 12 to 18 percent slopes.
Wellston silt loam, 12 to 18 percent slopes.
Wellston silt loam, 12 to 18 percent slopes, moderately eroded.
Zanesville silt loam, 12 to 18 percent slopes.
Zanesville silt loam, 12 to 18 percent slopes, moderately eroded.

Most of the acreage of these soils is in trees, pasture, or meadow. A few areas are in other crops; small grains and meadow are probably the most suitable crops. Many of the moderately eroded soils are in unimproved pasture, and some have been planted to pine Christmas trees.

Erosion is severe unless these soils are kept in grass or trees. Before attempting to plant row crops, divert water from higher areas. Till these soils on the contour, control grazing on pasture, and maintain good aftermath on meadow crops each fall to protect these soils in winter. Encourage growth of hardwoods, and cut trees carefully to protect young trees and to save the protective surface litter.

Cropping systems.—If stripcropping is provided, a good cropping system is a small grain for 1 year and meadow for 3 years. If practices to conserve soil and water are not practical, keep these soils in permanent grass. Watch your soils carefully for further erosion and study yields to determine how well your cropping system is working.

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. Add lime to these soils if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons per acre every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soils in capability unit IVe–2 that are in small grains for 1 year followed by 3 years of meadow.

	Improved management
Nitrogen	For wheat, 40 pounds.
Phosphate (P_2O_5)	50 pounds.
Potash (K_2O)	90 pounds.

Plant fescue or another permanent grass in areas that are better suited to pasture than to small grains. To establish the pasture, at or just before planting time apply, per acre, 30 pounds of nitrogen, 80 pounds of phosphate, and 40 pounds of potash. Yearly thereafter add 100

pounds of nitrogen, in split applications; 30 pounds of phosphate; and 60 pounds of potash.

CAPABILITY UNIT Vw-1

Only one soil, Atkins silt loam, is in this capability unit. This deep, poorly drained soil is on nearly level bottom lands that are frequently flooded (fig. 13). Standing water keeps it wet much of the time. Outlets for surface water are few, and drainage is difficult. This is a cold, gray soil that is mottled in the lower part of the profile. It is naturally strongly acid, contains little organic matter, and is low in fertility. The moisture-supplying capacity is very high.

Most of the acreage of this soil is wooded. Some areas have been cleared and drained, however, and are cropped in dry years when overflows are not frequent. In these areas soybeans and corn have been grown successfully. Build levees to protect this soil from floods. Install outlets for surface drainage. If tile is laid, the grade of the tile and the outlets must be sufficient to obtain drainage. The tile lines must be covered carefully so that silt does not fill the lines. Divert water from the adjacent upland.

Cropping systems.—Undrained areas of this soil are suited only to trees. Protect the woodlands from overgrazing to allow hardwoods to reseed. In drained areas, plant continuous row crops because they grow and mature when floods are uncommon. Small grains and legumes are not well suited.

Amendments needed.—This soil should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soil for testing. Add lime to this soil if the pH value is less than 6.5 to 6.7. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

Following are suggested amounts of nitrogen, phosphate, and potash to be applied per acre to the soil in capability unit Vw-1 under improved management that includes adequate drainage.

	Improved management
Nitrogen	For corn, 120 pounds. For wheat, 40 pounds.
Phosphate (P_2O_5)	35 pounds.
Potash (K_2O)	50 pounds.

If soybeans are grown, apply phosphate and potash in amounts listed but apply nitrogen only as a starter fertilizer.

CAPABILITY UNIT VIe-1

This capability unit consists of moderately deep to deep, moderately steep, well-drained soils on uplands and terraces (fig. 14). The surface layer of these soils varies in depth but is less than 3 inches thick in most places because of severe erosion. In many places the clayey subsoil is exposed. These soils have fairly low to low moisture-supplying capacity. The Trappist soils hold less water than the other soils because they are shallower to bedrock. In summer the soils in this unit are droughty. They are strongly acid, contain little organic matter, and are low in plant nutrients. The soils in this unit are:

- Cincinnati soils, 12 to 18 percent slopes, severely eroded.
- Grayford soils, 12 to 18 percent slopes, severely eroded.
- Jennings soils, 12 to 18 percent slopes, severely eroded.
- Jennings soils, heavy substratum, 12 to 18 percent slopes, severely eroded.
- Jennings soils, mixed substratum, 12 to 18 percent slopes, severely eroded.
- Otwell soils, 12 to 18 percent slopes, severely eroded.
- Parke soils, 12 to 18 percent slopes, severely eroded.
- Trappist soils, 6 to 12 percent slopes, severely eroded.
- Zanesville soils, 12 to 18 percent slopes, severely eroded.

Most of the acreage of these soils is in grass or trees. Many areas are in unproductive pasture grasses that are invaded by brush. Unless protected by vegetation, these soils erode readily. To prevent damage from runoff, divert water from higher areas and keep plant residue on these soils. Control grazing and maintain good aftermath on meadow each fall to protect these soils in winter and early in spring.

Permanent meadow, pasture, or trees are best suited to these soils; row crops are not suited. A suitable mixture for meadow consists of grasses and legumes that can be seeded with a small grain. Some areas can be planted to pine Christmas trees. Manage woodland carefully to encourage reseeding of desirable trees. For further information on woodland, read the section "Forestry."

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. For meadow containing legumes, add lime if the pH value is less than 6.5 to 6.7. Soils in grass should have a pH of about 6.0. After this pH is obtained, apply 1 to 3 tons of lime per acre every 6 to 8 years.

Figure 13.—**Flooded Atkins silt loam on bottom lands.**

Figure 14.—**Class VI soils in background.**

To establish a grass-legume meadow in small grain, plow down, per acre, 120 pounds of phosphate and 120 pounds of potash before seeding. For the small grain apply 40 pounds of nitrogen. Yearly thereafter apply 40 pounds of phosphate and 80 pounds of potash. To establish fescue or another permanent grass, at or just before seeding apply, per acre, 40 pounds of nitrogen, 100 to 120 pounds of phosphate, and 60 pounds of potash. Each year thereafter add 100 pounds of nitrogen, in split applications; 30 pounds of phosphate; and 60 pounds of potash.

CAPABILITY UNIT VIe-2

This capability unit consists of moderately deep to deep, moderately steep to steep, well-drained soils on uplands and terraces. The silt loam surface layer of the uneroded soils is normally 8 to 10 inches thick, but in the moderately eroded soils it is only 5 or 6 inches thick. Runoff is rapid. These soils are strongly acid, contain little organic matter, and are low in plant nutrients. The moisture-supplying capacity is fairly low to low. In most places the moderately eroded soils contain very little humus. The soils in this unit are:

- Cincinnati silt loam, 18 to 25 percent slopes.
- Cincinnati silt loam, 18 to 25 percent slopes, moderately eroded.
- Grayford silt loam, 18 to 25 percent slopes.
- Grayford silt loam, 18 to 35 percent slopes, moderately eroded.
- Jennings silt loam, mixed substratum, 18 to 25 percent slopes.
- Jennings silt loam, heavy substratum, 18 to 25 percent slopes.
- Otwell silt loam, 18 to 25 percent slopes.
- Parke silt loam, 18 to 25 percent slopes.
- Trappist silt loam, 12 to 25 percent slopes.
- Trappist silt loam, 12 to 25 percent slopes, moderately eroded.
- Wellston silt loam, 18 to 25 percent slopes.
- Wellston silt loam, 18 to 25 percent slopes, moderately eroded.
- Zanesville silt loam, 18 to 25 percent slopes.

Most of the acreage of these soils is in hardwoods, but a few cleared areas are in pasture. The pasture contains unproductive broomsedge and briers and needs to be improved. Some of the soils in this unit are now eroded. Most of the erosion is in areas that were cleared for crops or pasture.

Because of steep slopes and the hazard of erosion, a permanent cover is essential on all the soils of this unit. Pasture, forest, and habitats for wildlife are the best uses. Some areas are suited to pine Christmas trees.

To protect these soils from further erosion, divert water from higher areas and plant in strips on the contour so that all of the land is not bare at one time. Maintain plant residue on these soils to prevent erosion in winter and early in spring. To protect woodland, do not allow grazing, cut and remove timber carefully to protect young trees, and save the protective surface litter. Further information on woodland is in the section "Forestry."

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. For pasture grasses, add lime if the pH value is less than 6.0. After that pH is obtained, apply 2 or more tons of lime per acre every 6 to 8 years.

To establish fescue or another permanent grass in the uneroded areas, before or at seeding apply, per acre, 30 pounds of nitrogen, 80 pounds of phosphate, and 40 pounds of potash. The eroded areas need 40 pounds of nitrogen, 80 to 100 pounds of phosphate, and 60 pounds of potash. Yearly thereafter topdress with 100 pounds of nitrogen, in split applications; 30 pounds of phosphate; and 60 pounds of potash.

CAPABILITY UNIT VIIe-1

This capability unit consists of shallow to deep, moderately steep to steep, well drained to excessively drained soils on uplands. The surface layer of these soils varies in thickness but in many large areas is only 3 to 5 inches thick. Runoff is excessive in cleared areas. These soils are strongly acid, very low in organic-matter content, and low in plant nutrients. The moisture-supplying capacity is fairly low to low. In this unit are:

- Cincinnati silt loam, 25 to 35 percent slopes, moderately eroded.
- Jennings and Colyer silt loams, 18 to 25 percent slopes, moderately eroded.

All of the acreage of these soils is in unproductive grasses or in woods. The unimproved pasture is mostly broomsedge and briers mixed with brush. Many areas have been planted to pines, but these areas seldom reseed. Trees and pasture are the most profitable uses for these soils, which are too steep to crop.

These soils continue to erode unless protected by trees (fig. 15) or grass, and in places, it is necessary to divert water from higher areas. Use extreme care in grazing natural or improved pasture, and keep a good cover on these soils in periods of peak erosion. To manage hardwoods successfully, encourage reseeding of profitable trees, cut and remove timber carefully to protect young trees, and save the protective surface litter. For further information on woodland management read the section "Forestry."

Amendments needed.—These soils should be tested to determine the need for additional lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. To improve pasture, bring the pH of these soils to a value of about 6.0. After this reaction is obtained, apply 2 tons or more of lime per acre every 6 to 8 years.

To establish fescue or another permanent grass, before or at seeding apply, per acre, 40 pounds of nitrogen, 80 to 100 pounds of phosphate, and 60 pounds of potash. Yearly thereafter topdress with 100 pounds of nitrogen, in split applications; 30 pounds of phosphate; and 60 pounds of potash.

***Figure 15.*—Stand of young trees on strongly sloping class VII soil. The trees help to control runoff and erosion.**

CAPABILITY UNIT VIIe-2

This capability unit consists of shallow to deep, moderately steep, well drained to excessively drained soils on uplands and terraces, and of badly gullied land that is not suited to crops (fig. 16). In most places this gullied land is not so steep as the soils. The original surface layer of many members of this capability unit is missing in a great number of places and ranges from moderately thick to thin in others. The soils and the gullied land are strongly acid and contain very little organic matter. Because runoff is very rapid and erosion is severe, permanent vegetation is needed to prevent further gullying. The moisture-supplying capacity is low. This capability unit consists of:

- Cincinnati soils, 18 to 25 percent slopes, severely eroded.
- Gullied land, acid shale materials.
- Gullied land, neutral shale materials.
- Gullied land, glacial materials.
- Jennings soils, heavy substratum, 18 to 25 percent slopes, severely eroded.
- Jennings and Colyer soils, 18 to 25 percent slopes, severely eroded.
- Otwell soils, 18 to 25 percent slopes, severely eroded.
- Trappist soils, 12 to 25 percent slopes, severely eroded.
- Wellston soils, 12 to 18 percent slopes, severely eroded.
- Wellston soils, 18 to 25 percent slopes, severely eroded.
- Zanesville soils, 18 to 25 percent slopes, severely eroded.

Most of the acreage in this capability unit is in woods or is idle. Some areas are planted to pine, and a few areas are in improved pasture. Permanent vegetation is difficult to establish. To regrass large areas, plant the grass in strips on the contour and keep the alternate strips in native vegetation. Restrict grazing for the first few years, and in fall, leave a cover of ungrazed grass for protection in winte. A suitable mixture for meadow consists of grasses and legumes that can be seeded with a small grain.

One of the best ways of protecting these soils is to plant trees. Pines provide a good ground cover in a few years, but they grow slowly on these soils and are not suitable for Christmas trees. Turn to the section "Forestry" for further information on managing woodland.

Figure 16.—**Gullies caused by severe erosion on Gullied land, acid shale materials. Class VII land.**

Amendments needed.—These soils should be tested to determine the need for lime and fertilizer. Your county agent will help you prepare samples of your soils for testing. For meadow containing legumes, add lime if the pH value is less than 6.5 to 6.7. For grass pasture, bring the pH to 6.0. After this pH is obtained, apply 2 to 3 tons of lime per acre every 6 to 8 years.

To establish a grass-legume meadow in small grain, plow down, per acre, before seeding 120 pounds of phosphate and 60 pounds of potash. For the small grain apply 40 pounds of nitrogen. Yearly thereafter apply 40 pounds of phosphate and 80 pounds of potash. To establish fescue or another permanent grass, apply, per acre, 40 pounds of nitrogen, 100 to 120 pounds of phosphate, and 60 pounds of potash. Each year thereafter topdress with 100 pounds of nitrogen, in split applications; 30 pounds of phosphate; and 60 pounds of potash.

CAPABILITY UNIT VIIe-3

This capability unit consists of shallow to deep, moderately steep to very steep, moderately well drained to excessively drained soils on uplands. A few areas are narrow and blufflike. Runoff is very rapid, even in places that are well covered by vegetation. The soils in this unit are strongly acid, contain little organic matter, and are low in fertility. The moisture-supplying capacity is low. These soils are:

- Cincinnati silt loam, 25 to 35 percent slopes.
- Colyer soils, 12 to 25 percent slopes.
- Colyer soils, 25 to 60 percent slopes.
- Grayford silt loam, 25 to 35 percent slopes.
- Jennings silt loam, heavy substratum, 25 to 35 percent slopes.
- Jennings and Colyer silt loams, 18 to 25 percent slopes.
- Kinderhook silty clay loam, 12 to 18 percent slopes.
- Kinderhook silty clay loam, 18 to 35 percent slopes.
- Muskingum silt loam, 25 to 35 percent slopes.
- Muskingum silt loam, 35 to 70 percent slopes.

Most areas of these soils are too steep and shallow for pasture, but a few of the less steep areas are pastured. Nearly all the acreage is in hardwoods and pines. These trees normally grow slowly, but pines grow faster than the hardwoods. The Kinderhook soils are very poorly suited to trees. Most of the acreage of the Muskingum soils adjoins the Clark State Forest. Good practices for managing the forests include:

(1) Control of fire.
(2) Prevention of grazing.
(3) Removal of cull trees.
(4) Selective harvest that leaves adequate cover for the soil.
(5) Careful removal of cut timber to save young trees.

More information for woodland management is in the section "Forestry." The tables in that section list the potential of production for each soil series in the county and the trees suited to each.

Estimated Yields

Table 2 lists average acre yields of corn, soybeans, and wheat that can be expected on each soil in the county under two levels of management: In columns A are yields that can be expected under common, or prevailing, management. In columns B are yields that can be expected under improved management.

TABLE 2.—*Estimated average acre yields of corn, soybeans, and wheat at two levels of management*

[Yields in columns A are those to be expected over a 10-year period under common management; those in columns B, under improved management. Absence of yield means that crop is not suited to the soil or is not commonly grown]

Soil	Corn		Soybeans		Wheat	
	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Atkins silt loam						
Avonburg silt loam, 0 to 2 percent slopes	45	90	15	25	20	30
Avonburg silt loam, 2 to 6 percent slopes	45	110 90	15	25	20	30
Avonburg silt loam, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Cana silt loam, 0 to 2 percent slopes	45	90	15	25	20	30
Cana silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Cana silt loam, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Cana soils, 2 to 6 percent slopes, severely eroded	35	55	10	20	10	18
Cincinnati silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Cincinnati silt loam, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Cincinnati silt loam, 6 to 12 percent slopes	40	70	15	25	20	30
Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Cincinnati silt loam, 12 to 18 percent slopes					20	30
Cincinnati silt loam, 12 to 18 percent slopes, moderately eroded					15	25
Cincinnati silt loam, 18 to 25 percent slopes						
Cincinnati silt loam, 18 to 25 percent slopes, moderately eroded						
Cincinnati silt loam, 25 to 35 percent slopes						
Cincinnati silt loam, 25 to 35 percent slopes, moderately eroded						
Cincinnati soils, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Cincinnati soils, 12 to 18 percent slopes, severely eroded						
Cincinnati soils, 18 to 25 percent slopes, severely eroded						
Clermont silt loam	50	90	13	23	13	20
Colyer soils, 12 to 25 percent slopes						
Colyer soils, 25 to 60 percent slopes						
Dubois silt loam, 0 to 2 percent slopes	45	90	15	25	20	30
Dubois silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Dubois silt loam, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Grayford silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Grayford silt loam, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Grayford silt loam, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Grayford silt loam, 12 to 18 percent slopes, moderately eroded					15	25
Grayford silt loam, 18 to 25 percent slopes						
Grayford silt loam, 18 to 35 percent slopes, moderately eroded						
Grayford silt loam, 25 to 35 percent slopes						
Grayford soils, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Grayford soils, 12 to 18 percent slopes, severely eroded						
Gullied land, acid shale materials						
Gullied land, neutral shale materials						
Gullied land, glacial materials						
Haubstadt silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Haubstadt silt loam, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Haubstadt soils, 2 to 6 percent slopes, severely eroded	35	65	10	20	10	18
Haymond silt loam, 0 to 2 percent slopes	50	95	23	35	20	30
Haymond silt loam, 2 to 6 percent slopes	50	95	23	35	20	30
Haymond silt loam, high bottom, 0 to 2 percent slopes	50	95	23	35	20	30
Haymond silt loam, high bottom, 2 to 6 percent slopes	50	95	23	35	20	30
Jennings silt loam, mixed substratum, 6 to 12 percent slopes	40	70	15	25	20	30
Jennings silt loam, mixed substratum, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Jennings silt loam, mixed substratum, 12 to 18 percent slopes					20	30
Jennings silt loam, mixed substratum, 18 to 25 percent slopes						
Jennings soils, mixed substratum, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Jennings soils, mixed substratum, 12 to 18 percent slopes, severely eroded						
Jennings silt loam, heavy substratum, 2 to 6 percent slopes	45	90	15	25	20	30
Jennings silt loam, heavy substratum, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Jennings silt loam, heavy substratum, 6 to 12 percent slopes	40	70	15	25	20	30
Jennings silt loam, heavy substratum, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Jennings silt loam, heavy substratum, 12 to 18 percent slopes					20	30
Jennings silt loam, heavy substratum, 12 to 18 percent slopes, moderately eroded					15	25
Jennings silt loam, heavy substratum, 18 to 25 percent slopes						
Jennings silt loam, heavy substratum, 25 to 35 percent slopes						
Jennings soils, heavy substratum, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Jennings soils, heavy substratum, 12 to 18 percent slopes, severely eroded						
Jennings soils, heavy substratum, 18 to 25 percent slopes, severely eroded						
Jennings silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Jennings silt loam, 2 to 6 percent slopes, moderately eroded	40	70	13	23	15	25
Jennings silt loam, 6 to 12 percent slopes	40	70	15	25	20	30
Jennings silt loam, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Jennings silt loam, 12 to 18 percent slopes					20	30
Jennings silt loam, 12 to 18 percent slopes, moderately eroded					15	25

TABLE 2.—*Estimated average acre yields of corn, soybeans, and wheat at two levels of management*—Continued

Soil	Corn		Soybeans		Wheat	
	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Jennings soils, 2 to 6 percent slopes, severely eroded	35	55	10	20	10	18
Jennings soils, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Jennings soils, 12 to 18 percent slopes, severely eroded	----	----	----	----	----	----
Jennings and Colyer silt loams, 18 to 25 percent slopes	----	----	----	----	----	----
Jennings and Colyer silt loams, 18 to 25 percent slopes, moderately eroded	----	----	----	----	----	----
Jennings and Colyer soils, 18 to 25 percent slopes, severely eroded	----	----	----	----	----	----
Johnsburg silt loam	45	90	15	25	20	30
Kinderhook silty clay loam, 12 to 18 percent slopes	----	----	----	----	----	----
Kinderhook silty clay loam, 18 to 35 percent slopes	----	----	----	----	----	----
Made land	----	----	----	----	----	----
Muskingum silt loam, 25 to 35 percent slopes	----	----	----	----	----	----
Muskingum silt loam, 35 to 70 percent slopes	----	----	----	----	----	----
Otwell silt loam, 2 to 6 percent slopes	40	68	15	25	20	30
Otwell silt loam, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Otwell silt loam, 12 to 18 percent slopes	----	----	----	----	20	30
Otwell silt loam, 18 to 25 percent slopes	----	----	----	----	----	----
Otwell soils, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Otwell soils, 12 to 18 percent slopes, severely eroded	----	----	----	----	----	----
Otwell soils, 18 to 25 percent slopes, severely eroded	----	----	----	----	----	----
Parke silt loam, 2 to 6 percent slopes, moderately eroded	40	68	13	23	15	25
Parke silt loam, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Parke silt loam, 12 to 18 percent slopes	----	----	----	----	20	30
Parke silt loam, 18 to 25 percent slopes	----	----	----	----	----	----
Parke soils, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Parke soils, 12 to 18 percent slopes, severely eroded	----	----	----	----	----	----
Philo silt loam, 0 to 2 percent slopes	50	95	23	35	18	28
Philo silt loam, 2 to 6 percent slopes	50	95	23	35	18	28
Pope silt loam	50	95	23	35	20	30
Robinson silt loam	50	70	13	23	13	20
Rossmoyne silt loam, 0 to 2 percent slopes	45	90	15	25	20	30
Rossmoyne silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Rossmoyne silt loam, 2 to 6 percent slopes, moderately eroded	40	68	13	23	15	25
Rossmoyne silt loam, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Rossmoyne soils, 2 to 6 percent slopes, severely eroded	35	55	10	20	10	18
Rossmoyne soils, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Stendal silt loam	45	95	20	35	15	25
Tilsit silt loam, 0 to 2 percent slopes	45	90	15	25	20	30
Tilsit silt loam, 2 to 6 percent slopes	45	90	15	25	20	30
Tilsit silt loam, 2 to 6 percent slopes, moderately eroded	40	68	13	23	15	25
Trappist silt loam, moderately well drained, 2 to 6 percent slopes	35	80	15	25	20	30
Trappist silt loam, moderately well drained, 2 to 6 percent slopes, moderately eroded	30	50	13	23	15	25
Trappist silt loam, 2 to 6 percent slopes	25	65	13	23	13	23
Trappist silt loam, 6 to 12 percent slopes	25	65	15	25	20	30
Trappist silt loam, 2 to 6 percent slopes, moderately eroded	20	40	10	20	10	20
Trappist silt loam, 6 to 12 percent slopes, moderately eroded	20	40	13	23	15	25
Trappist silt loam, 12 to 25 percent slopes	----	----	----	----	----	----
Trappist silt loam, 12 to 25 percent slopes, moderately eroded	----	----	----	----	----	----
Trappist soils, 6 to 12 percent slopes, severely eroded	18	35	10	20	10	18
Trappist soils, 12 to 25 percent slopes, severely eroded	----	----	----	----	----	----
Wakeland silt loam	45	90	20	30	15	25
Wellston silt loam, 2 to 6 percent slopes	35	80	15	25	20	30
Wellston silt loam, 6 to 12 percent slopes	25	65	15	25	20	30
Wellston silt loam, 12 to 18 percent slopes	----	----	----	----	20	30
Wellston silt loam, 12 to 18 percent slopes, moderately eroded	----	----	----	----	15	25
Wellston silt loam, 18 to 25 percent slopes	----	----	----	----	----	----
Wellston silt loam, 18 to 25 percent slopes, moderately eroded	----	----	----	----	----	----
Wellston soils, 12 to 18 percent slopes, severely eroded	----	----	----	----	----	----
Wellston soils, 18 to 25 percent slopes, severely eroded	----	----	----	----	----	----
Whitcomb silt loam	45	90	15	25	20	30
Wilbur silt loam, 0 to 2 percent slopes	50	95	23	35	18	28
Wilbur silt loam, high bottom, 0 to 2 percent slopes	50	95	23	35	18	28
Wilbur silt loam, high bottom, 2 to 6 percent slopes	50	95	23	35	18	28
Zanesville silt loam, 2 to 6 percent slopes, moderately eroded	40	68	13	23	15	25
Zanesville silt loam, 6 to 12 percent slopes	40	68	15	25	20	30
Zanesville silt loam, 6 to 12 percent slopes, moderately eroded	35	65	13	23	15	25
Zanesville silt loam, 12 to 18 percent slopes	----	----	----	----	20	30
Zanesville silt loam, 12 to 18 percent slopes, moderately eroded	----	----	----	----	15	25
Zanesville silt loam, 18 to 25 percent slopes	----	----	----	----	----	----
Zanesville soils, 6 to 12 percent slopes, severely eroded	25	55	10	20	10	18
Zanesville soils, 12 to 18 percent slopes, severely eroded	----	----	----	----	----	----
Zanesville soils, 18 to 25 percent slopes, severely eroded	----	----	----	----	----	----

Common management only partly provides the following: (1) Correction of soil acidity and maintenance or increase of soil fertility; (2) control of loss in soil and water; (3) maintenance of organic matter; (4) control of weeds and insects; (5) minimum tillage; and (6) adequate drainage.

Improved management provides (1) application of lime and fertilizer according to the results of soil tests; (2) addition of supplemental nitrogen; (3) control of loss in soil and water through contour tillage, stripcropping, terracing, wheel-track planting, and other conservation practices; (4) surface or tile drainage, or both, (5) use of crop residue to protect the soil and add organic matter; (6) improved cropping systems that provide grasses and legumes where needed; (7) minimum tillage and cultivation at the proper time; (8) control of weeds and insects; and (9) use of suitable crop varieties.

The estimates in table 2 are averages that are expected over a period of 10 years. They are primarily based on observations made by personnel of the Soil Conservation Service; on interviews with farmers, with the county agent, and with members of the Purdue University Agricultural Experiment Station; and on results obtained on experimental fields by the experiment station.

The yield estimates listed in table 2 do not apply to every tract of land in any particular year. Management differs from farm to farm, and the weather changes from year to year. The estimates indicate, however, the relative productivity of the soils in the county and their response to good management.

Yields of corn from small plots of 4-H clubs ranged from 60 to 172 bushels per acre over a 10-year period. The average was 97 bushels per acre. The highest yields were on plots that had the rows spaced closer than normal and on plots that received large applications of fertilizer. The lowest yields were on plots that received common management.

Because available information is insufficient on the yields of vegetables, special crops, and hay, yields of these crops are not estimated for each soil in the county. Under the same kind of management, however, yields of vegetables and tobacco are about the same wherever grown because, as a rule, only the best soils are used for these crops. Because of the wide range in soil properties, yields of legumes and mixed hay vary more than those of vegetables.

Following are estimated average yields per acre of vegetables, special crops, and hay at two levels of management:

	Common management	*Improved management*
Buckwheat	16 bushels	25 bushels.
Cabbage	12 tons	22 tons.
Sweet corn	3 tons	5 tons.
Lespedeza seed	180 pounds	350 pounds.
Pumpkins	7 tons	12 tons.
Tobacco	1,500 pounds	2,200 pounds.
Tomatoes	9 tons	18 tons.
Alfalfa	2.5 tons	4 tons.
Clover	1.5 tons	2.25 tons.
Mixed hay	1.5 tons	2.5 tons.

Under common, or prevailing, management, 1½ acres of pasture is needed to graze 1 cow for 6 months; under improved management, only 1 acre of pasture is needed.

Management of Soils for Vegetables and Special Crops

Many of the soils in Scott County are suited to vegetables and special crops because they are fertile and have good internal drainage as well as a loose, friable surface layer. Vegetables and special crops need a more fertile soil than do most other crops. Have your soils tested before these crops are grown so that you will know their need for amendments.

To soils in vegetables, add organic matter by plowing under annually large amounts of manure, crop residue, cover crops, or green-manure crops. The organic matter keeps nutrients in a form that plants can use, increases the moisture-holding capacity of the soil, improves tilth, and makes the soil more suitable for irrigation. It also lessens compaction of the soil by heavy machinery.

Irrigation can be used to increase yields of vegetables and tobacco if all practices of improved management are followed. All the soils in this county that can be cultivated intensively to vegetables are suitable for irrigation. For more information, read the subsection "Irrigation."

Vegetables are very susceptible to disease and to damage by insects. For information on crop varieties that are resistant to disease and for other information about the control of disease, consult the Agricultural Extension Office of Scott County. At this office you can also obtain other information on soil management.

In Scott County, vegetables are grown mainly for two canneries. These canneries are at Austin and Scottsburg. They furnish the farmer with plants or seed, spray, spraying equipment, and harvesting equipment. Personnel from the canneries supervise harvesting, which is done by migrant workers. The main crops grown for the canneries are cabbage, sweet corn, tomatoes, and pumpkins.

Irrigation

Only a small acreage is irrigated in Scott County, but the irrigated acreage in crops of high value is increasing. Irrigation is particularly needed in years when rainfall is less than normal.

Before you plan an irrigation system you should know the:

(1) Expected increase in yield.
(2) Rate that your soils take in water.
(3) Available moisture-holding capacity of your soils.
(4) Availability of water for irrigation.
(5) Amount of labor needed.
(6) Cost of installation and application.

Specifically, you should do these things:

(1) See that an adequate, dependable source of water is available before you purchase equipment.
(2) Obtain a permit to use water for irrigation if the source of water is a public lake or a navigable stream.
(3) Choose productive land for irrigation.

(4) Select crops of high value that respond to irrigation.
(5) Obtain technical assistance in checking water supply, in designing and laying out the irrigation system, and in practicing the soil management that irrigation requires.

Wildlife Management

A well-managed system of farming maintains the soils and provides food and cover for wildlife as well. Farming that depletes the soils reduces wildlife and, therefore, increases the number of destructive insects and animals. On most farms, habitats for wildlife can be improved by practices that supply or increase food and cover.[1]

Food and cover

On only a few farms in the county is the balance ideal between cover and food for wildlife. Some farms consist almost entirely of class I soils that are used to produce crops. Here, food for wildlife may be abundant but cover is scarce. Other farms consist largely of class VI and class VII soils. Here, the pasture and woods furnish ample cover but food may be scarce.

The soils in the different classes, however, can be managed so that both food and cover are available. On the soils in classes I, II, and III where food is ample but cover is scarce, cover can be provided by fence rows, by vegetation on the banks of drainage ditches and streams, by windbreaks, and by perennial borders. In addition to these places of cover, odd areas and areas around ponds and in marshes can be used for both food and cover on soils in classes III, IV, V, and VI. On class VI and class VII soils, plant wildlife borders that produce seed and fruit and plant small areas in grasses and conifers.

Following are suggestions for managing different areas so that ample food and cover are provided for wildlife.

Cropland.—Use a cropping system that includes grass-legume meadows and cover crops. Delay mowing waterways and headlands until after grain is harvested so that nesting birds are not disturbed. Leave standing small areas of grain adjacent to woods. Leave cover on ground in winter and plow in spring.

Pasture.—Do not permit overgrazing. Renovate and reseed old, depleted pasture. Delay mowing until early in summer to protect nesting birds.

Woodland.—Protect from fire and overgrazing. In logging, leave trees that have dens for squirrels. Leave hollow fallen logs, and pile brush near the edge of woods. In thickly wooded places, clear small areas so deer can browse.

Banks of ditches and streams.—Establish and maintain grass on the banks to prevent erosion and to keep silt from filling the streams and ditches. Delay mowing, grazing, and spraying until nesting birds have flown away. Plant trees and shrubs for windbreaks where needed.

Fence rows.—Plant native shrubs and multiflora roses along fences. Use a cropping system that provides sweetclover or lespedeza.

Odd areas.—Fence these places to keep out livestock. Keep half the area in grass, or in grass and legumes mixed, and half in other plants suited to food and cover for wildlife.

[1] UNITED STATES DEPARTMENT OF AGRICULTURE. MAKING LAND PRODUCE USEFUL WILDLIFE. Bul. 2035, 29 pp., illus. 1951.

Ponds.—Fence out livestock. To prevent erosion and keep silt from filling the ponds, improve and maintain ground cover. Keep half the surrounding area in grass or in a mixture of grass and legumes. Keep woody plants back from the water. To improve fishing, fertilize ponds so that more plant life is supplied for food.

Windbreaks.—Protect from fire and overgrazing. Plant suitable trees and shrubs but control unwanted weeds and woody plants.

Kinds of wildlife

Most game birds, fish, and animals common in the region live in Scott County and provide hunting, fishing, and trapping. The numbers of the different kinds of birds vary considerably. Pheasants have been stocked many times in the county, but the vegetation and climate are not suited to their reproduction. The pheasants nest, but the weather is too hot and dry for the eggs to hatch. Ruffed grouse have been reported in general soil area 5 in the southwestern part of the county where large wooded areas provide food and cover. The five general soil areas in the county are delineated on the general soil map in the back of this report. Quail are plentiful. These birds feed in the bottom lands of general soil areas 1 and 2 and nest in the uplands of areas 3 and 4. They use the woods for cover and protection, but they stay near farms and feed on small grain. Korean lespedeza makes good food and cover.

Ducks are not abundant, but a few are found along the East Fork Muscatatuck River and near ponds in the uplands. Scott County is east of the main flight lanes for migrating birds, but some wild geese have been killed around farm ponds. Songbirds are plentiful, and many of them stay in the county through winter. Deer have been released in the Muscatatuck Knobs in Washington County and in the Clark State Forest. Two herds of deer that came from those areas have relocated in this county. One herd lives in the steep wooded areas, locally called Knobs, in the southwestern part of Scott County, and the other is along the bottom lands of the East Fork Muscatatuck River in the northwestern part. The number of deer in the county increased from 20 in 1944 to 35 in 1956.

Rabbits and squirrels are the most abundant animals. The rabbits prefer agricultural areas, where they obtain food and cover. They live in all parts of the county except the steep wooded areas and the wooded bottom lands. Squirrels need a cover of woods and are mostly in the southwestern part of Scott County. Fox squirrels are plentiful in small woodlots adjacent to cultivated areas.

Fish are scarce because the county does not have many streams and lakes and some of the streams are polluted. Because of laws against pollution, fishing in the East Fork Muscatatuck River has improved. As new laws are enforced, fishing in other streams should also improve. Farm ponds in the uplands provide good fishing (fig. 17).

Muskrat, raccoon, skunk, opossum, mink, and other fur-bearing animals are hunted by sportsmen, but commercial trapping and hunting are not profitable, because hides are poor and prices are low. A few mink are trapped along the large streams. Raccoon and opossum are abundant throughout the county and are increasing in number. These animals are hunted and trapped less than they were formerly, and the woods in which they

Figure 17.—**One of the many farm ponds that provide good fishing.**

live are better protected from fire. The increased muskrat population is a problem around some farm ponds.

Preying animals and birds are numerous. The woods adjacent to cultivated areas protect them and provide nesting places. Hawks and owls feed on small game and field mice, which are abundant. Foxes roam throughout the county and bear their young in burrows in well-drained, steep areas. They find plenty of smaller animals for food.

Forestry [2]

Timber harvesting was profitable during the settlement of Scott County, but the virgin timber was eventually exhausted and agriculture became the most important enterprise in the county. Much of the county has been reforested, however, and now 35 percent of the acreage is in trees.[3] Woodlands are managed more carefully than in the early days when no attempt was made to reforest cutover areas.

Until a few years ago, livestock were commonly grazed in woodlands. This practice damaged the mixed stands of hardwoods because livestock are selective in their grazing. They severely damage or destroy the better species. Today, woodlands are being protected as the management of woodlands improves.

Some of the soils of Scott County are poorly suited to trees; others are well suited. Trees on the Colyer, Muskingum, and Kinderhook soils grow slowly and are of poor quality. The Cincinnati, Parke, and Otwell soils, however, produce good stands of rapidly growing trees. The growth of trees is affected by the depth of the soil, by compact soil layers or pans, by the content of moisture, by slope, and by the amount of erosion.

Table 3 lists estimated yields of hardwoods for each soil series; table 4 lists trees suitable for planting.

Forests in the General Soil Areas

Because the soils in each general soil area in the county differ, they have different potentials for producing timber. To locate the five general soil areas, turn to the general soil map at the back of this report. The woodlands in the five general soil areas are described in the following pages.

General soil area 1

A fairly large part of general soil area 1 is in trees. Cultivated crops are not widely grown, because much of the area is frequently flooded. Generally, the shallow soils in this area and soils that are frequently flooded are used for trees.

The Haymond, Wilbur, and Wakeland soils have a large part of their acreage in trees. These soils are on level to gently sloping bottom lands and are imperfectly drained to well drained.

Trees common in the area are sweetgum, soft maple, ash, yellow-poplar, and white oak. These trees generally have good form and make fairly rapid growth. Sweetgum, ash, and maple have seeds that are light in weight. These seeds spread rapidly and invade idle cropland.

Logging in this area is generally done late in fall and in winter when the ground is frozen. In other seasons, the ground is too wet for logging or crops may be damaged when the logs are hauled to roadways.

General soil area 2

Timber is produced in general soil area 2 on soils on terraces and on bottom lands. The soils on terraces differ from those on bottom lands and are suitable for different kinds of trees.

The Haubstadt, Otwell, Dubois, and Robinson soils on terraces produce a great deal of timber, though they make up only 4 percent of this soil area. On these soils are sweetgum, yellow-poplar, white ash, and white oak. These trees have good form and make good growth. They provide cover that protects the soils from erosion. Logging is fairly easy and economical because the trees are accessible.

The Pope, Philo, Stendal, and Atkins soils on bottom lands are not generally planted to crops. These soils are frequently flooded, and internal drainage is very slow. Timber is the best crop on these soils. Most of the acreage in trees on the bottom lands of this soil area is on Atkins soils. In many places, the bottom lands support pure stands of pin oak. Other trees are swamp white oak, swamp chestnut oak, sweetgum, soft maple, and river birch. Each overflow on idle bottom lands reseeds the bottom lands to stands of even-age trees. These stands are normally very thick and should be thinned while the trees are fairly young. Because the bottom lands are wet, the trees do not grow so rapidly as they do on the better drained soils in general soil area 1. Logging is fairly difficult because of wetness. The best time to log on these bottom lands is late in summer and in fall.

General soil area 3

The principal soils in general soil area 3 are of the Clermont, Avonburg, Rossmoyne, Whitcomb, and Cana series. These soils are poorly drained to moderately well drained and are level to gently sloping. The woodlands in the area consist of small woodlots that are managed according to regular farming practices. In large level areas, drainage is difficult; wetness and poor

[2] This section was written by JOHN O. HOLWAGER, woodland conservationist, Soil Conservation Service.

[3] U.S. FOREST SERVICE. CENTRAL STATES FOREST EXPERIMENT STATION. FOREST STATISTICS OF SOUTHERN INDIANA. For. Serv. Rel. 10, 40 pp., illus. 1951.

TABLE 3.—*Estimated yields for good, medium, and poor stands of hardwoods*

[Dashed lines indicate absence of trees]

Soil series	Yields for trees 12 inches or more in diameter (DBH)[1]					
	Cool sites[2]			Hot sites[3]		
	Good density[4] (50 or more trees per acre)	Medium density[4] (40 to 50 trees per acre)	Poor density[4] (Less than 40 trees per acre)	Good density[4] (50 or more trees per acre)	Medium density[4] (40 to 50 trees per acre)	Poor density[4] (Less than 40 trees per acre)
	Bd. ft. per acre	*Bd. ft. per acre*	*Bd. ft. per acre*	*Bd. ft. per acre*	*Bd. ft. per acre*	*Bd. ft. per acre*
Atkins	250	190	125	-----	-----	-----
Avonburg	300	225	150	-----	-----	-----
Cana	300	225	150	-----	-----	-----
Cincinnati	400	300	200	300	225	150
Clermont	300	225	150	-----	-----	-----
Colyer	150	110	75	75	50	30
Dubois	300	225	150	-----	-----	-----
Grayford	400	300	200	250	190	125
Haubstadt	250	190	125	-----	-----	-----
Haymond	400	300	200	-----	-----	-----
Jennings	250	190	125	150	100	75
Jennings, mixed substratum	400	300	200	300	225	150
Jennings, heavy substratum	300	225	150	-----	-----	-----
Johnsburg	250	190	125	-----	-----	-----
Kinderhook	150	110	75	75	50	30
Muskingum	200	150	100	100	75	50
Otwell	400	300	200	300	225	150
Parke	400	300	200	300	225	150
Philo	400	300	200	-----	-----	-----
Pope	400	300	200	-----	-----	-----
Robinson	250	190	125	-----	-----	-----
Rossmoyne	250	190	125	-----	-----	-----
Stendal	400	300	200	-----	-----	-----
Tilsit	250	190	125	-----	-----	-----
Trappist	200	150	100	100	75	50
Trappist, moderately well drained	200	150	100	-----	-----	-----
Wakeland	400	300	200	-----	-----	-----
Wellston	300	225	150	150	100	75
Whitcomb	300	225	150	-----	-----	-----
Wilbur	400	300	200	-----	-----	-----
Zanesville	200	150	100	150	110	75

[1] Diameter at breast height, or 4½ feet above the ground.

[2] Cool sites are on southeastern, eastern, northeastern, northern, and northwestern slopes and on other slopes of less than 12 percent; in coves; and on the lower slopes.

[3] Hot sites are on western, southwestern, and southern slopes, and on other slopes of more than 12 percent; on narrow ridgetops; and on the upper slopes.

[4] Trees 12 inches or more in diameter at breast height.

natural drainage restrict the growth of trees. Trees grow faster, however, and are of better quality on soils in area 3 than on soils in area 2.

Trees that are common are sweetgum, soft maple, yellow-poplar, white ash, beech, and black oak. A few walnut, red oak, white oak, and blackgum trees also occur. Soft maple, sweetgum, yellow-poplar, and white ash are very aggressive and reseed old fields in a few years. These trees have seeds that are light in weight. Except in spring when soils are wet, logging can be done throughout the year. Slopes are mild, and good roads are fairly near the wooded areas.

General soil area 4

The principal soils in general soil area 4 are in the Cincinnati, Jennings, Grayford, and Zanesville series. These soils are sloping to steep and are on uplands. They erode rather rapidly if a cover is not maintained. Trees help to control erosion. This general soil area is the best in the county for trees that have rapid growth and high quality. Commonly harvested for saw and veneer logs are white oak, red oak, yellow-poplar, white ash, black walnut, black cherry, sugar maple, hickory, and beech. Good drainage permits year-round logging.

General soil area 5

The principal soils in this general soil area are in the Muskingum, Wellston, and Kinderhook series. These soils are steep to very steep and are mostly shallow. Chestnut oak, scarlet oak, black oak, white oak, and hickory are common in this area, but these trees produce timber of poor quality. Virginia pine is well suited to the soils. In many old fields, this pine reseeds more rapidly than native hardwoods and produces better timber.

Large tracts of trees occur in soil area 5. About 61 percent of this area is owned by the State of Indiana. Though the trees are poor, they help protect the soils from erosion. They also improve the area for recreation, and they provide cover for wildlife.

Harvesting trees in this area is expensive because slopes are steep and only a few access roads are available. Cutting, therefore, is generally heavy and infrequent.

TABLE 4.—*Trees suitable for planting on some soils in Scott County*

Soils	Trees suited to protected cool sites on—		Trees suited to exposed hot sites on—	
	Uneroded to moderately eroded soils	Severely eroded soils	Uneroded to moderately eroded soils	Severely eroded soils
Shallow to moderately deep soils that have low available moisture-holding capacity: Colyer. Kinderhook. Muskingum. Trappist.	White pine, red pine, shortleaf pine, Scotch pine,[1] and Austrian pine.[1]	Shortleaf pine, white pine, Virginia pine, Scotch pine,[1] and Austrian pine.[1]	Red pine, shortleaf pine, Scotch pine,[1] Austrian pine,[1] and Virginia pine.	Shortleaf pine, Virginia pine, and Scotch pine.[1]
Deep soils that have good relationship of roots, air, and water: Otwell. Parke.	Black locust,[2] white pine, red pine, shortleaf pine, yellow-poplar,[3] black walnut,[3] and white ash.[3]	Black locust,[2] red pine, white pine, shortleaf pine, Scotch pine,[1] and Austrian pine.[1]	Black locust,[2] white pine, red pine, shortleaf pine, Virginia pine, yellow-poplar,[3] and white ash.[3]	Black locust,[2] Virginia pine, shortleaf pine, Scotch pine,[1] and Austrian pine.[1]
Moderately well drained to well-drained soils that have optimum growth of timber: Cincinnati. Grayford. Haymond. Jennings. Philo. Pope. Wellston. Wilbur. Zanesville.	White pine, red pine, shortleaf pine, yellow-poplar,[3] and white ash.[3]	Shortleaf pine, white pine, Virginia pine, Scotch pine,[1] and Austrian pine.[1]	Red pine, white pine, shortleaf pine, Virginia pine, Scotch pine,[1] and Austrian pine.[1]	Virginia pine, shortleaf pine, Scotch pine,[1] and Austrian pine.[1]
Moderately deep to deep, imperfectly drained to moderately well drained soils: Avonburg. Cana. Dubois. Haubstadt. Johnsburg. Rossmoyne. Stendal. Tilsit. Wakeland. Whitcomb.	White pine, red pine, shortleaf pine, Scotch pine,[1] yellow-poplar,[3] and white ash.[3]	Shortleaf pine, white pine, Virginia pine, and Scotch pine.[1]	White pine, shortleaf pine, Virginia pine, and Scotch pine.[1]	Virginia pine, shortleaf pine, and Scotch pine.[1]

[1] For Christmas trees only. [2] For fence posts only. [3] For spot planting in woodland openings.

Estimated Yields of Hardwood Timber

In table 3 are estimated yields of hardwoods in stands of good, medium, and poor density on soils of all the soil series in Scott County. These estimates are based on information obtained from permanent growth plots that are maintained jointly by the Extension Department of Purdue University and the Soil Conservation Service. Many one-half acre plots have been established in the State since 1947. The actual growth of the trees on these plots is measured every 2 years.

Scott County has four plots on the Cincinnati and Avonburg soils and two plots on the Cana soils. In nearby counties, studies are being made on the Wellston, Muskingum, Clermont, and Rossmoyne soils and on Trappist soils underlain by black oil shale. Yields on soils in the same series are generally higher on cool sites than on hot sites. The estimates in table 3 are for uneroded soils; yields on the eroded soils would be lower than those listed.

Tree Planting

Many areas in Scott County that have been cultivated are better suited as woodland, as wildlife habitats, and as recreation areas than they are as cropland. In table 4 are listed the kinds of trees suitable for planting on protected cool sites and on exposed hot sites. Trees for planting are available at the State Forest Tree Nursery at Henryville, in Clark County.

The Atkins, Clermont, and Robinson soils are not included in table 4, because natural regeneration is normally better on these soils than planting. These soils are poorly drained and are too wet for optimum growth of timber. However, white pine, loblolly pine, sweetgum, soft maple, cottonwood, and cypress do grow on these soils on both cool and hot sites.

Protection from Livestock and Fire

About 40 percent of the woodland in Scott County is grazed by livestock at least part of the time. Grazing animals should not be allowed on the woodland, because they destroy the young trees and the protective underbrush. Also, the woodland provides little food for livestock.

Forest fires were common in the early settlement of the county because woodland was burned over frequently to destroy insects and snakes. State laws now prohibit

the burning of timber, and a fire-detection system provides lookout towers where fires are spotted before they can spread. Consequently, forest fires are no longer common in the county.

Use of Timber

Much of the timber produced is used by wood-processing plants in and near Scott County. White oak, red oak, black walnut, and yellow-poplar are made into veneer of high quality at plants in Seymour, New Albany, and Jeffersonville. Factories at Paoli and Salem that make handles for tools and other items use a great deal of hickory and sugar maple. A factory that makes boxes and baskets uses much cottonwood, maple, and other softwoods. Several sawmills provide rough lumber for commercial and home use.

Soil Properties Important in Engineering[4]

This soil survey report contains information about the soils of Scott County that will help engineers in selecting sites for buildings and other structures; in choosing locations for highways and airports; in determining the load-bearing qualities of soils; in locating limestone quarries suitable for making graded aggregate for use in construction; and in planning dams, ponds, and other structures that control floods and conserve soil and water.

This report, including the soil maps, is too generalized for some engineering purposes, but it provides information that is valuable in planning detailed field surveys and in planning tests to determine the condition of soils in place at sites of proposed construction. After testing the soil materials and observing their behavior in place and under varying conditions, the engineer can estimate to some extent the properties of individual soils wherever the soils are mapped.

In table 5 soil properties important in engineering are listed, and ratings are assigned for the suitability of the soils for irrigation and sites of farm ponds. Also listed in this table are problems of drainage and suggested practices to overcome these problems, as well as suggested practices for control of erosion. Because the properties of Gullied land and Made land vary greatly from place to place, these land types are not included in table 5.

Formation, Classification, and Morphology of Soils

This section has three main parts. The first part discusses the five factors of soil formation and tells how these factors affected the formation of soils in Scott County. In the second part, the classification of soils is explained and the soil series in the county are placed in their higher categories. The third part describes the great soil groups and compares the morphology of the soils in these great soil groups.

[4] This section was written by LAURENCE W. TRUEBLOOD, area engineer, Soil Conservation Service.

Factors of Soil Formation

Soil is produced by the action of soil-forming processes on materials that have been deposited or accumulated by geologic action. The characteristics of a soil at any given location are determined by (1) the climate, particularly temperature and precipitation; (2) the plant and animal life on and in the soils; (3) the physical and mineral composition of the parent material; (4) the relief or lay of the land; and (5) the length of time these forces of soil development have acted on the soil material in place.

Climate and vegetation are the active forces of soil genesis. They act on the parent material that has accumulated through the weathering of rocks and slowly change this material into a natural body with genetically related soil horizons. The effects of climate and vegetation are conditioned by relief, which, in turn, affects runoff and erosion. The parent material affects the kind of profile that is formed and, in some places, dominates this formation. Finally, time is needed for all of the soil-forming factors to change parent material into a soil. Normally, a long time is needed for the development of a profile that has distinct soil horizons.

The five soil-forming forces are complex. It is difficult to isolate any one force and state that it has had the most influence on the formation of a soil. It is helpful to discuss each factor and its effects on soil formation, but it should be remembered that it is the interaction of all these factors, rather than of any one, that determines the nature of the soil profile.[5]

Climate

The low base saturation and the depth of weathering in the soils of Scott County indicate that the climate in the area used to be much warmer in past ages than it is now. But climate has been uniform from year to year for a long time. The climate is of the humid-temperate, continental type that is characteristic of the north-central part of the United States. Except in the Alluvial soils, rainfall has moved downward the clay, clay minerals, soluble organic matter, and lime. Thus, the soils have become acid and medium to low in fertility.

The temperature and precipitation vary considerably with the seasons. The average annual temperature is 55.5° F., but maximum and minimum temperatures of 109° and −32° have been recorded. The average annual precipitation is 41.67 inches, although extremes of 26.7 inches and 67.4 inches are on record. The precipitation is adequate for normal plant growth during most of the year. The summer weather is suitable for fairly rapid decomposition of organic matter. This decomposition is indicated by thin, dark-colored A_1 horizons in the soils.

Living organisms

Trees, shrubs, grasses, and other plants; micro-organisms; earthworms; and burrowing animals live on and in the soil and are active in the soil-forming processes. The nature of the changes that these organisms bring about

[5] UNIVERSITY OF WISCONSIN AGRICULTURAL EXPERIMENT STATION. SOILS OF THE NORTH-CENTRAL REGION OF THE UNITED STATES. 192 pp. illus., Bul. 544, Pub. 76. 1960.

depends, among other things, on the kinds of plant and animal life and the life process peculiar to each.

In this county, the native vegetation is mainly deciduous forests of oak, hickory, elm, maple, beech, and yellow-poplar. Most of these trees are deep feeders, but they return to the surface of the soil bases, phosphorus, organic matter, and minerals in the form of dead leaves and roots. Other natural vegetation consists of raspberry, blackberry, rose, briers, sumac, and various other plants. Differences in the kinds of vegetation seem to be related to differences in relief and drainage.

The forest litter from leaves and branches does not add so much organic material and bases to the soil as does the litter from grasses. The organic matter is added to the surface soil in the fall, but little decomposition occurs until spring. With the rise in temperature, micro-organisms attack and rapidly decompose the leaves and litter, which form an A_0 horizon. Earthworms digest and mix organic matter with the dark-colored mineral soil to form the A_1 horizon.

Parent materials

The soils in Scott County have developed from glacial drift, loess, weathered sedimentary rocks, and alluvial materials.[6] Glacial drift is material that has been transported by ice or by water from melted ice. Loess is wind-deposited silt. Sedimentary rocks are rocks formed by the consolidation of sediments from streams and lakes. In this county, they include sandstone, siltstone, acid and neutral shale, and limestone. Some of the alluvial materials were deposited a long time ago, and some were deposited recently.

Most of this county is covered by loess, but none of the soils have developed entirely in this material. The thickness of these loessal deposits ranges from several feet in the northern part of the county to a few inches in the southern part. The deepest loess is between Big Ox Creek and U.S. Highway No. 31. Some areas in the uplands have deposits 30 to 80 inches deep, but the Knobs area in the southern part of the county has only a thin mantle.

Figure 18, page 56, shows the geologic formations underlying the soils of Scott County or the kinds of materials in which these soils formed.

Most of the soils in the county developed in loess over Illinoian glacial drift. This drift consists of many different kinds of ground-up rock. It contains mineral plant nutrients and a considerable amount of limestone. In the Cincinnati, Rossmoyne, and Avonburg soils, the lime has been leached to depths of 10 to 12 feet. Where the glacial drift is less than 10 feet thick over bedrock, the soil profile is leached free of lime and is strongly acid. In the transitional area between the glacial drift and the residual soils, the glacial till is difficult to recognize. The Trappist soils developed in a thin layer of loess and glacial drift and in material weathered from the underlying black shale. In figure 19, page 57, are shown the parent material and parent rock of some of the soils in the southeastern part of the county and the positions of these soils on the landscape.

In the Knobs area in the southwestern part of the county, the Zanesville, Wellston, and Muskingum soils developed in materials weathered from brown shale and sandstone. The shale and sandstone, commonly called knobstone shale, were capped by a thin layer of loess (fig. 20, page 58). They are underlain by neutral grayish-green shale. This shale has affected the development of the soils on the lower part of very steep slopes.

The grayish-green soft clay shale is of the New Providence formation of the Lower Mississippian era. It extends eastward to the south-central part of the county and is commonly called soapstone. Formed in material weathered from this shale are the lower part of the Jennings soils that have a heavy substratum, some of the Trappist soils, and all the Kinderhook soils.

The development of the Jennings, Colyer, Cana, and Whitcomb soils has been affected to a large extent by material weathered from New Albany shale, but the effect of this shale has not been dominant except in the Colyer soils. This shale is dark brown to black and is acid. It is widespread in the eastern part of the county and is locally called slate.

Outcrops of Devonian limestone occur in a few areas in the eastern part of Scott County. The Devonian limestone is exposed in the valleys of a few creeks, and southwest of Kinderhook Lake, it is exposed in the form of a discontinuous ledge. This ledge is at depths of 6 inches to 3 feet and is underlain by black shale.

Sediments deposited by water are the parent materials of soils on bottom lands and on terraces along the Muscatatuck River, and along the many drainageways that dissect the county. The Haymond, Wilbur, Wakeland, Pope, Philo, and Stendal soils are forming in recent deposits and are too young to have distinct profile characteristics. In contrast, the Otwell, Haubstadt, Dubois, and Robinson soils developed in older, weathered deposits of mixed, stratified materials and have well-developed profiles.

Relief

The relief of Scott County, or the inequalities in the land surface, is great. Within short distances, the landscape changes from flats to very steep slopes. The highest point in the county is in the southwestern part, in the Clark State Forest. This point is 1,017 feet above sea level. The lowest point, 530 feet above sea level, is in the northwestern part of the county where Big Ox Creek empties into the Muscatatuck River. The elevation at Scottsburg is 569 feet.

Relief, as a factor in soil formation, affects drainage, runoff, and erosion. The Clermont soils, for example, are on broad flats in the uplands where drainage is very poor. These soils have a deeply leached profile and a compact subsoil. The relief partly accounts for the erosion that removes the more fertile surface soil. On steep slopes, runoff removes soil material as fast as it forms and the soils remain shallow.

The level or nearly level bottom lands make up 22 percent of Scott County. Partly because of flatness, many soils on the bottom lands have slow runoff and poor drainage. The level to gently rolling uplands make up 46 percent of the county. Most of the acreage on these uplands is moderately eroded. The strongly rolling to steep upland hills make up about 24 percent of the county. The soils on these hills are moderately eroded to severely eroded and have had more than half of the original surface soil removed. The hills in the Knobs area make up

[6] LOGAN, WILLIAM N. HANDBOOK OF INDIANA GEOLOGY. Ind. Dept. of Cons., Div. of Geol. 1,120 pp. illus., Pub. 21. 1922.

TABLE 5.—*Soil properties*

Soil series	Depth to rock	Kind of underlying rock	Dominant texture		Permeability of subsoil	Rate of infiltration
			Surface soil	Subsoil		
	Feet					
Atkins	10+	Sandstone and shale	Silt loam	Silt loam	Slow	Low
Avonburg	10+	Limestone, shale, and sandstone.	Silt loam	Silty clay loam.	Slow	Low
Cana	3½–6	Black shale	Silt loam	Silty clay loam.	Moderately slow.	Medium
Cincinnati	6+	Limestone, shale, and sandstone.	Silt loam	Silty clay loam.	Moderate	Medium
Clermont	6–10+	Limestone and shale	Silt loam	Silty clay loam.	Very slow	Very low
Colyer	0–1½	Black shale	Silt loam	Silt loam	Rapid	High
Dubois	10+	Limestone and shale	Silt loam	Silty clay loam.	Slow	Low
Grayford	3+	Limestone	Silt loam	Silty clay loam.	Moderate	Medium
Haubstadt	10+	Limestone and shale	Silt loam	Silty clay loam.	Moderately slow.	Medium
Haymond	2–10+	Shale and limestone	Silt loam	Silt loam	Moderate	Medium
Haymond (high bottom)	3–10+	Shale and limestone	Silt loam	Silt loam	Moderate	Medium
Jennings	3½–6	Black shale	Silt loam	Silty clay loam.	Moderately slow.	Medium
Jennings (heavy substratum).	3½–6	Grayish-green clay shale	Silt loam	Silty clay loam.	Moderately slow.	Medium
Jennings (mixed substratum).	3½–6	Limestone and shale	Silt loam	Silty clay loam.	Moderate	Medium
Johnsburg	3½–6	Shale and sandstone	Silt loam	Silty clay loam.	Slow	Low
Kinderhook	0–1½	Grayish-green clay shale	Silty clay loam.	Silty clay loam.	Moderately slow.	High
Muskingum	0–2	Siltstone, sandstone, and shale	Silt loam	Silt loam	Rapid	High
Otwell	10+	Limestone, shale, and sandstone.	Silt loam	Silty clay loam.	Moderate	Medium
Parke	6–10+	Shale and sandstone	Silt loam	Silty clay loam.	Moderately rapid.	High
Philo	10+	Shale	Silt loam	Silt loam	Moderately slow.	Medium
Pope	10+	Black and gray shale	Silt loam	Silt loam	Moderate	Medium
Robinson	10+	Limestone and shale	Silt loam	Silty clay loam.	Very slow	Very low
Rossmoyne	6–10+	Black and gray shale	Silt loam	Silty clay loam.	Moderately slow.	Medium
Stendal	10+	Limestone and shale	Silt loam	Silt loam	Slow	Low
Tilsit	5–10+	Shale and sandstone	Silt loam	Silty clay loam.	Moderately slow.	Medium
Trappist (moderately well drained).	1½–3½	Black shale	Silt loam	Silty clay loam.	Moderate	Medium
Trappist	1½–3½	Black shale and grayish-green clay shale.	Silt loam	Silty clay loam.	Moderately slow.	Medium
Wakeland	3–10+	Limestone and shale	Silt loam	Silt loam	Slow	Low

important to engineering

Suitability for irrigation	Suitability for ponds	Drainage: Problems	Drainage: Suggested practices	Practices needed to control erosion
Suited	Well suited	Susceptible to frequent floods; high water table in spring; very slow permeability.	Divert water; install surface drains and tile lines.	None.
Suited	Well suited	Fragipan; slow permeability.	Install tile lines; smooth the surface.	Divert excess water with diversion terraces; grass the waterways; dig ditches across slopes.
Suited	Fairly well suited.	None	None	Divert excess water; grass the waterways; cultivate on the contour.
Suited	Well suited	None	None	Divert excess water; plant on terraces; stripcrop; grass the waterways.
Suited	Well suited	High water table in spring and fall; some ponding; very slow permeability.	Install surface drains; smooth the surface.	None.
Not suited	Not suited	None	None	Keep in trees.
Suited	Well suited	Susceptible to occasional overflow; fragipan; slow permeability.	Install surface drains; smooth the surface.	Dig ditches across slopes; divert water in grassed waterways.
Suited	Poorly suited	None	None	Divert water from higher lying soils; cultivate on the contour; keep steep soils in pasture or trees.
Suited	Well suited	None	None	Grass the waterways.
Suited	Poorly suited	None	None	None.
Suited	Poorly suited	None	None	Leave crop residue on soil; plant cover crops.
Suited	Well suited	None	None	Divert water; grass the waterways; cultivate on the contour and on terraces; keep steep soils in pasture, meadow, or trees.
Suited	Very well suited	None	None	Divert water; grass the waterways; cultivate on the contour; keep steep soils in trees.
Suited	Well suited	None	None	Plant on terraces and on contour; stripcrop; divert water in grassed waterways.
Suited	Well suited	Fragipan	Install surface drains; smooth the surface.	Divert excess water in grassed waterways.
Not suited	Very well suited	None	None	Keep in trees.
Not suited	Not suited	None	None	Keep in trees and plant cleared areas to trees.
Suited	Well suited	None	None	Divert water; grass the waterways; cultivate on the contour; keep steep soils in pasture, meadow, or trees.
Suited	Only with a sealing blanket.	None	None	Divert excess water; plant on terraces and stripcrop; keep strongly sloping soils in permanent vegetation.
Suited	Fairly well suited.	Moderately slow permeability.	Install tile lines in some places.	None.
Suited	Fairly well suited.	None	None	None.
Suited	Well suited	Very slow permeability	Install surface drains	None.
Suited	Well suited; use core trench.	Moderately slow permeability.	None	Divert water from higher soils; plant on terraces and stripcrop; keep strongly sloping soils in pasture, meadow, or trees.
Suited	Well suited	High water table in spring and fall; slow permeability.	Install tile lines and surface drains; smooth the surface.	None.
Suited	Well suited; use core trench.	Fragipan	None	Cultivate the sloping soils on the contour and stripcrop.
Suited	Fairly well suited.	None	None	Divert excess water with diversion terraces; grass the waterways; stripcrop.
Suited	Fairly well suited.	Seeps; moderately slow permeability.	Divert water by means other than tile lines.	Divert water; cultivate on the contour; keep strongly sloping soils in permanent vegetation and keep steep soils in trees.
Suited	Well suited	High water table in spring and fall; slow permeability.	Install tile lines and surface drains.	None.

TABLE 5.—*Soil properties*

Soil series	Depth to rock	Kind of underlying rock	Dominant texture		Permeability of subsoil	Rate of infiltration
			Surface soil	Subsoil		
Wellston	2–3	Shale and sandstone	Silt loam	Silty clay loam.	Moderate	Medium
Whitcomb	3½–6	Black shale	Silt loam	Silty clay loam.	Slow	Low
Wilbur	3–10+	Limestone and shale	Silt loam	Silt loam	Moderately slow.	Medium
Wilbur (high bottom)	3–10+	Limestone and shale	Silt loam	Silt loam	Moderate	Medium
Zanesville	5–12	Brown shale	Silt loam	Silty clay loam.	Moderate	Medium

about 8 percent of the county. About one-fifth of this area has been cleared, and erosion has removed most of the surface soil.

Time

Climate, vegetation, parent material, and relief require time to interact and form soils. Geologically, the soils in Scott County are in two age groups—old and young.

The old soils developed in glacial drift, in residuum from acid sandstone and brown shale, and in residuum from neutral, grayish-green shale. In small areas, old soils have formed in residuum from acid, black shale. The residual soils formed in residuum from shale and sandstone. They are not so deep as the soils formed in glacial drift, because of the slower weathering in acid, nonsoluble materials and also because erosion wears away the soil material almost as rapidly as it forms. Some of the soils are leached to a shallower depth than the soils formed in glacial drift and have weaker profile development.

The young soils are shallow lithosolic soils on steep slopes and alluvial soils on bottom lands. On the steep slopes, natural or geological erosion removes the soil material as rapidly as it forms. On bottom lands, new materials are continually being deposited by overflows.

Classification of Soils

Soils may be classified in several ways to bring out their relationship to one another. The simple classification units commonly used in the field are the series, type, and phase. The soil type is the basic classification unit. It consists of soils that are similar in kind, thickness, and arrangement of soil layers.

A soil type may consist of several phases. Characteristics that suggest dividing a soil type into phases are variations in slope, degree of erosion, topographic position, and substratum material. The soil phase, or the soil type if it has not been subdivided, is the unit shown on the soil map.

Soil types are grouped into soil series. The soil series consists of two or more soil types that differ in surface texture but that are otherwise similar in kind, thickness, and arrangement of layers. Each series is named for the place near where it was first mapped; for example, the Cincinnati series is named for Cincinnati, Ohio.

In this report most of the names of the soils consist of the series name, the type, and the phase. Consider for example, Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded. Cincinnati is the series name; silt loam is the type; and the phase designation is 6 to 12 percent slopes, moderately eroded. A few soil names consist only of the series and type because variations in slope, erosion, or other characteristics are not great enough to be included in the soil name. Atkins silt loam is an example.

Soil series are classified into great soil groups. A great soil group consists of soils that have similar major profile characteristics. Their horizons are arranged in the same way, although the soils may differ in such things as thickness of profile and degree of development in the different horizons.

The great soil groups in this county are (1) Gray-Brown Podzolic soils, intergrading to Red-Yellow Podzolic soils; (2) Red-Yellow Podzolic soils, intergrading to Gray-Brown Podzolic soils; (3) Sols Bruns Acides, intergrading to Lithosols; (4) Planosols; (5) Low-Humic Gley soils, intergrading to Alluvial soils; (6) Alluvial soils; (7) Alluvial soils, intergrading to Low-Humic Gley soils; and (8) Lithosols. The miscellaneous land types are not classified by great soil groups. A miscellaneous land type in Scott County is Made land.

In the highest category of classification, the great soil groups have been placed in three orders, zonal, intrazonal, and azonal. The zonal order is made up of soils with evident, genetically related horizons that reflect the predominant influence of climate and living organisms in their formation. The intrazonal order consists of soils with evident, genetically related horizons that reflect the dominant influence of a local factor, such as topography or parent material, over the effects of climate and living organisms.

The azonal order is made up of soils that lack distinct, genetically related horizons, commonly because of youth, resistant parent material, or steep topography. The classification of the soils in this county is largely based on characteristics observed in the field. It may be revised as knowledge about the soil series and their

important to engineering—Continued

Suitability for irrigation	Suitability for ponds	Drainage		Practices needed to control erosion
		Problems	Suggested practices	
Suited	Well suited	None	None	Keep in trees.
Suited	Fairly well suited; use core trench.	Imperfect drainage	Install surface drains and, in some places, tile lines.	None.
Suited	Fairly well suited.	Moderately slow permeability.	Install tile lines in some places.	None.
Suited	Fairly well suited.	None	None	Grass waterways on sloping soils.
Suited	Well suited	None	None	Stripcrop, terrace, and cultivate on contour; keep severely eroded soils and strongly sloping soils in pasture, meadow, or trees.

relations increases. In table 6 the soils are classified according to order, great soil group, and series.

Morphology of Soils by Great Soil Groups

In this subsection the morphology of the soils of all the series in Scott County is discussed. Soil profiles that represent each series are described in the section "Descriptions of Soils."

Gray-Brown Podzolic soils, intergrading to Red-Yellow Podzolic soils

Undisturbed Gray-Brown Podzolic soils have a rather thin organic covering (A_0 horizon) and organic mineral layers (A_1 horizon) that overlie a grayish-brown, leached A_2 horizon. The A_2 horizon rests upon an alluvial, brown B horizon. In Scott County, the material underlying the B horizon consists of loessal or alluvial silts, glacial till, or material weathered from limestone, sandstone, or shale.

The Gray-Brown Podzolic soils that intergrade to Red-Yellow Podzolic soils formed under deciduous trees in a temperate, humid-continental climate. Although their chief characteristics cause them to be classified as Gray-Brown Podzolic soils, they have some characteristics like those of the Red-Yellow Podzolic soils. The A_1 horizon is thinner and is commonly acid, and the A_2 and B_1 horizons generally have a higher color value than do the A_2 and B_1 horizons of the Gray-Brown Podzolic soils of the central concept. The base saturation is 20 to 40 percent and is lower than that in the Gray-Brown Podzolic soils of the central concept, which have a base saturation of 40 to 70 percent in the B horizon. It ranges from 20 to 40 percent in the B horizon. Also, the calcium-magnesium ratio of these intergrades is about 1 to 1 as compared to 2 to 1 and higher in typical Gray-Brown Podzolic soils. The differences among the soils of this group have been caused largely by differences in natural drainage and parent material.

The well-drained soils in this group are in the Cincinnati, Grayford, Jennings, Otwell, Parke, and Wellston series. The Cincinnati soils developed in loess that extends to depths of 10 to 40 inches, and the loess is underlain by Illinoian glacial till that is leached of carbonates to depths of 10 to 12 feet. The Cincinnati soils are less red and contain less clay in the subsoil than the Grayford soils. Cincinnati soils differ from Jennings soils by being deeper to shale and developed in loess and underlying till. In the Cincinnati soils, the depth to shale is greater than 72 inches, whereas the shale underlying the Jennings soils is at depths of 40 to 72 inches. In areas of the Cincinnati soils where the till extends to depths greater than 10 feet, the loamy till above the shale is neutral to calcareous in reaction while that of the Jennings soils is strongly acid.

The Otwell soils, which occur on terraces in Scott County, resemble the Cincinnati soils but are more uniform in color and texture. Also, the Otwell soils are underlain by alluvial materials, whereas the Cincinnati soils are underlain by glacial till.

The Parke soils of the uplands developed in loess over permeable outwash material, whereas the Cincinnati and Jennings soils developed in loess underlain by slowly permeable glacial till, which, in turn, is underlain by shale.

The moderately well drained soils of this group are in the Cana, Haubstadt, and Rossmoyne series. The Cana soils of the uplands developed in loess that extends to depths of 12 to 30 inches, and they are underlain by a layer of till. The till, in turn, is underlain by shale or slate at depths of 40 to 72 inches. The loess, till, and shale have contributed to the development of these soils.

The Haubstadt soils, which occur on terraces in Scott County, developed in a thin mantle of loess. This loess is underlain by a mixture of lacustrine or alluvial materials.

The Rossmoyne soils of the uplands contain few or no fragments of shale in the lower part of the subsoil, whereas the Cana soils have many shale fragments mixed with glacial till. The Rossmoyne soils are deeper than the Cana soils and are underlain by calcareous till instead of by acid shale.

Red-Yellow Podzolic soils, intergrading to Gray-Brown Podzolic soils

A Red-Yellow Podzolic soil of the central concept is strongly leached, acid in reaction, low in exchangeable cations and base saturation, and low in organic matter and in mineral plant nutrients. The surface soil is generally light colored except for a thin A_1 horizon. The subsoil is finer textured than the surface soil and more highly

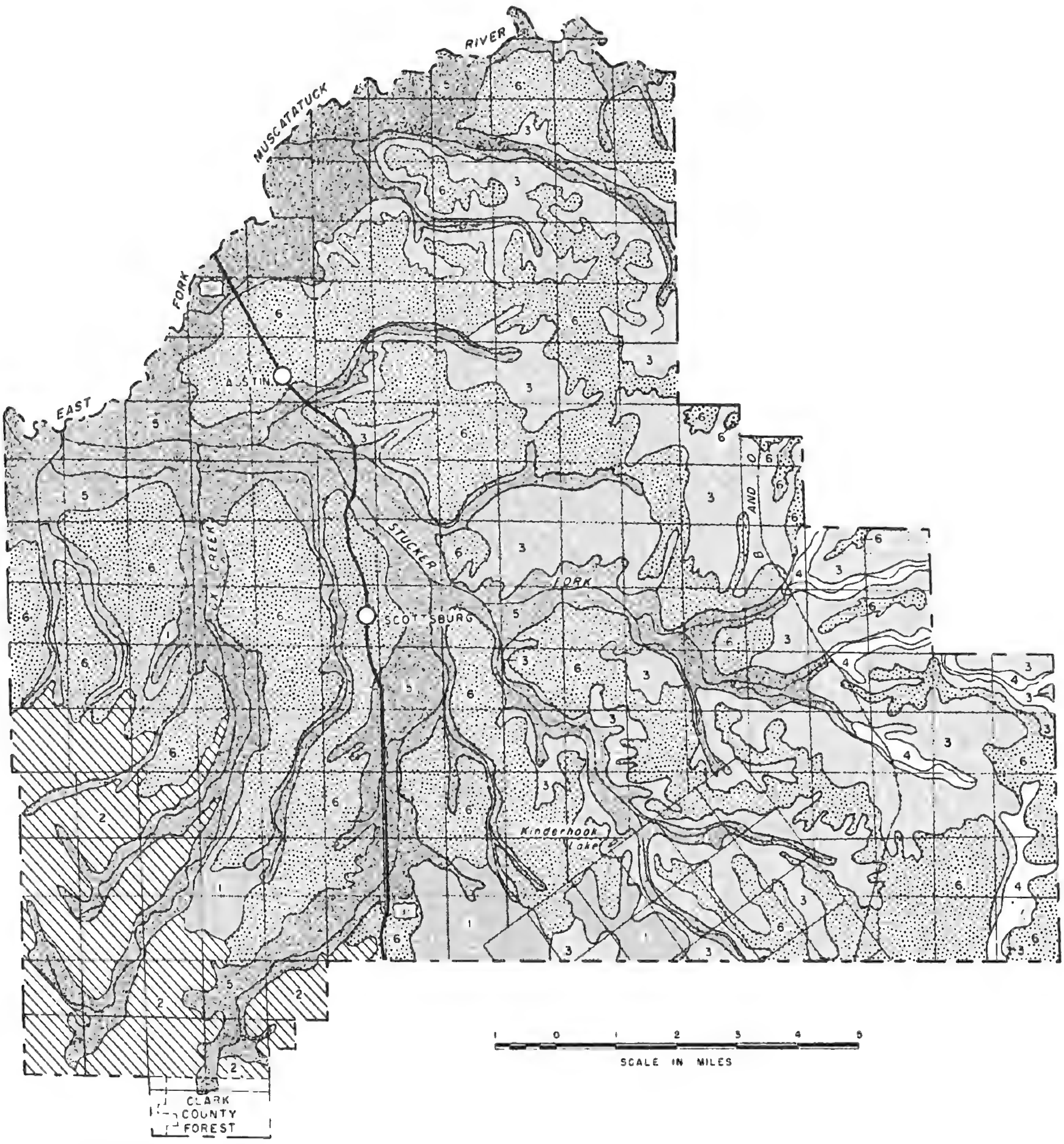

Figure 18.—Geologic map of Scott County: (1) neutral grayish-green New Providence clay shale; (2) acid brown shale and sandstone; (3) acid black and brown oil shale of the New Albany formation; (4) Devonian limestone; (5) lacustrine, bottom-land, and terrace areas consisting of alluvial and colluvial materials; and (6) Illinoian till. In most places, the county is covered with a mantle of loess that ranges from a few inches to several feet in thickness.

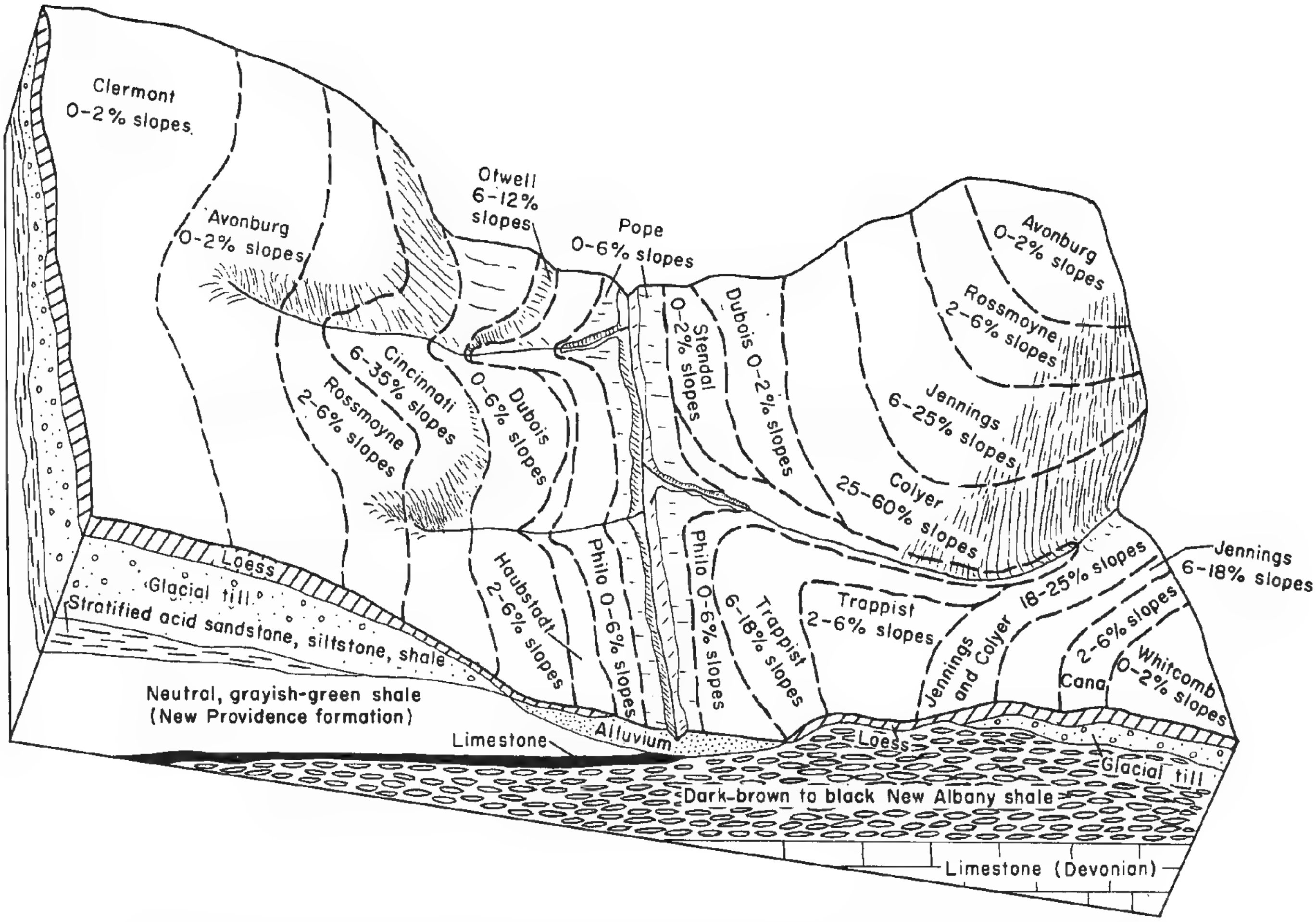

***Figure 19.*—Parent material and parent rock of some of the soils in the southeastern part of the county.**

oxidized. It is red or yellow in places and is somewhat mottled in the lower part. The undisturbed Red-Yellow Podzolic soils have a thin, organic A_0 horizon and an organic-mineral A_1 horizon, which overlies a light-colored, somewhat bleached but yellowish A_2 horizon. The A_2 horizon, in turn, overlies a red, yellowish-red, or yellow, more clayey B horizon. Coarse, reticulate streaks or mottles of red, yellow, brown, and light gray occur in deep horizons where the parent materials are thick.

The Red-Yellow Podzolic soils that intergrade to Gray-Brown Podzolic soils formed under deciduous trees in a temperate, humid-continental climate. Although their chief characteristics cause them to be classified as Red-Yellow Podzolic soils, they have some characteristics like those of the Gray-Brown Podzolic soils. They have the sequence of horizons and the degree of structural development generally in Gray-Brown Podzolic soils. The differences among the soils of this group have been caused largely by differences in natural drainage and parent material.

The well-drained soils in this group are in the Trappist and Zanesville series. The Trappist soils developed in shallow loess that is less than 18 inches thick in most places. The loess is underlain by material weathered from acid bituminous shales or neutral, soft clay shales, which weather to very acid materials. The Zanesville soils developed in loess that extends to depths of 18 to 48 inches. The loess is underlain by material weathered from stratified sandstone, siltstone, and shale.

The moderately well drained soils of this group are in the Tilsit series and include a moderately well drained variant of the Trappist series. The Tilsit soils developed in loess 18 to 48 inches thick. The loess is underlain by material weathered from stratified sandstone, siltstone, and shale. The moderately well drained variant of the Trappist series developed in the same kinds of material as the well drained Trappist soils. This variant, however, is mottled gray at depths of 14 to 20 inches because of a moderately compact fragipan below these depths.

Sols Bruns Acides, intergrading to Lithosols

The Sols Bruns Acides of the central concept have distinct A_1 and A_2 horizons but do not have a distinctive concentration of clay in the B horizon. They do have a color B and weak structural development. Some of the soils in Scott County have a moderately well developed concentration of clay in the B horizon; however, this concentration is not so well developed as it would be in a Gray-Brown Podzolic soil of the central concept. The base saturation is lower than that in the Gray-Brown Podzolic soils. Since the Sols Bruns Acides in Scott

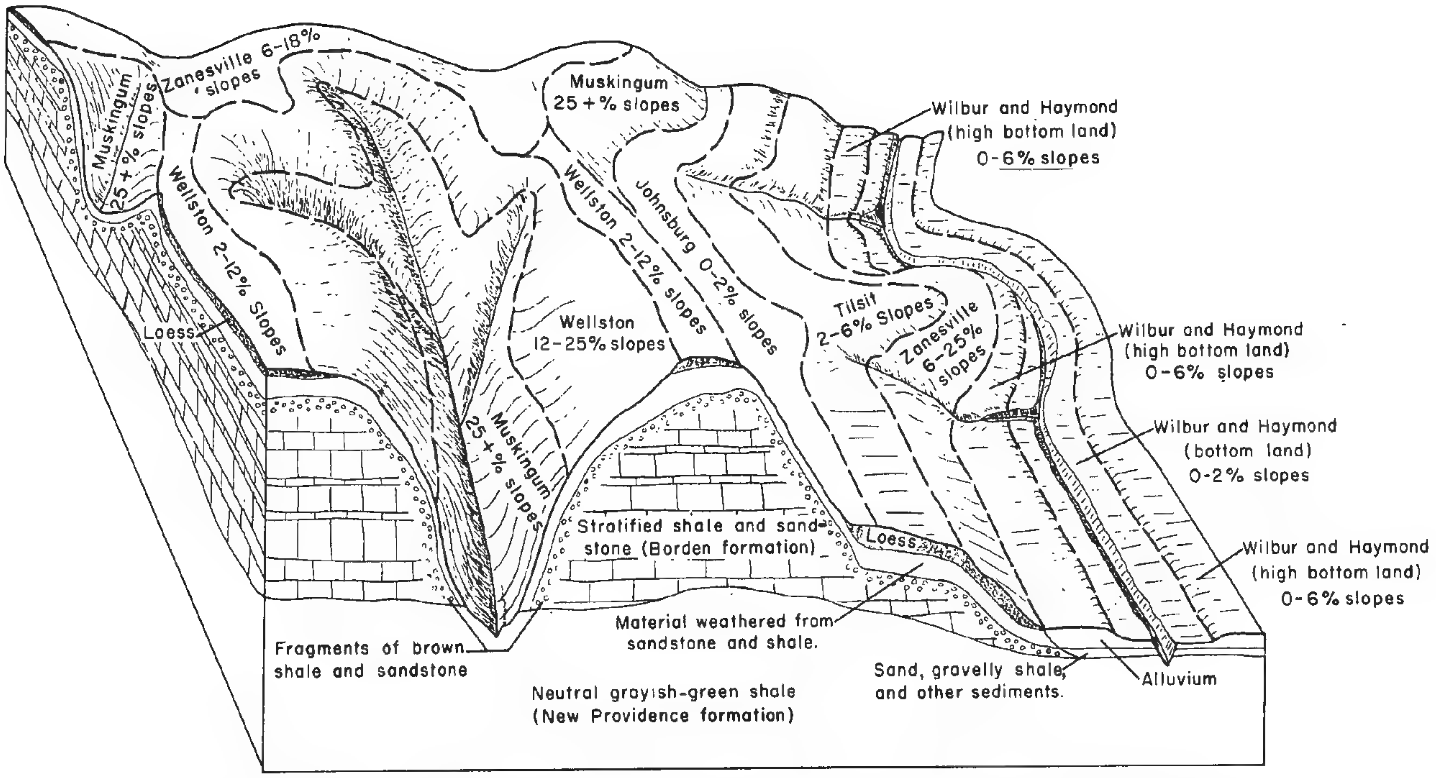

Figure 20.—**Parent material and underlying rock of soils in the southwestern part of the county, or Knobs area.**

County have some of the characteristics of Lithosols, they intergrade to that great soil group.

The Sols Bruns Acides in Scott County are in the Kinderhook and Muskingum series. Their differences are largely the result of differences in natural drainage and parent material.

The Kinderhook soils are moderately well drained to well drained. They formed in residuum weathered from neutral, grayish-green, soft clay shale. The shale weathers to strongly acid material but still retains its identity as soft clay shale. In most places the shale is at depths less than 40 inches, and in some places it has a thin mantle of loess.

The Muskingum soils are excessively drained. They formed in material weathered from stratified acid shale, siltstone, and sandstone, which are normally overlain by a thin mantle of loess. Some of the harder, more persistent sandstone fragments are generally on the surface and in the soil. The depth to bedrock is 6 to 26 inches.

Planosols

The Planosols have eluviated surface and subsurface horizons underlain abruptly by B horizons that are either strongly illuviated or moderately illuviated, and compacted. They are of two general kinds, those with claypans and those with fragipans, but only the latter occur in this county.

Planosols with fragipans commonly develop under a timber cover. They have in some places either a weakly developed, textural and structural B horizon above the pan or a light gray A_2 horizon between the textural B horizon and the pan. The prismatic tops and the faces of peds of the structural B horizon are capped and coated with light-gray silt. The fragipans are cemented and have a hard, brittle consistence when dry. They contain little clay and are plastic and sticky when wet.

Planosols in Scott County that are imperfectly drained commonly have weak, textural B horizons. They are polygenetic and developed in a thin mantle of loess over one of four kinds of underlying material. This underlying material is (1) medium-textured lacustrine material, chiefly silty clay loam to fine sand; (2) loam to coarse clay loam till of Illinoian age; (3) residuum from acid, brown sandstone, siltstone, and shale; or (4) dark-brown oil shale. The differences among the members of this group are related largely to differences in natural drainage and in parent materials.

The imperfectly drained soils of this group are of the Avonburg, Dubois, Johnsburg, and Whitcomb series. The Avonburg soils developed in loess that extends to depths of 40 to 80 inches. The loess is underlain by leached Illinoian till, which normally becomes calcareous at depths of 10 to 12 feet or more. The depth to shale ranges from 6 to 30 feet.

The Avonburg soils are somewhat similar to the Whitcomb soils, but the loess mantle of the Whitcomb soils is thinner and is underlain by glacial till at depths of 12 to 30 inches. Also, the till of the Whitcomb soils is underlain by and partly developed in acid shale at depths of 40 to 72 inches.

The imperfectly drained Dubois soils occur on terraces in Scott County. They developed in mixed alluvial materials that are chiefly lacustrine materials, of Illinoian age, mixed with local materials.

The Johnsburg soils are somewhat similar to the Dubois soils but have more distinct horizons and a more

TABLE 6.—*Classification of soil series by higher categories and factors that have contributed to differences in soil morphology* [1]

ZONAL SOILS

Great soil group and soil series	Relief	Drainage	Depth of leaching [2]	Surface material	Underlying material
			Feet		
Gray-Brown Podzolic soils (intergrade to Red-Yellow Podzolic soils):					
Cana	Nearly level to gently sloping.	Moderately well drained.	(3)	Loess, 12 to 30 inches thick.	Illinoian glacial till that extends to depths of 3 to 6 feet and is underlain by dark-brown, acid, bituminous shale that is partly decomposed.
Cincinnati	Gently sloping to steep.	Well drained	10+	Loess, 10 to 40 inches thick.	Illinoian glacial till that extends to depths of 10 to 12 feet.
Grayford	Gently sloping to steep.	Well drained	3–6	Loess, 0 to 20 inches thick.	Glacial till over residuum of red clay; limestone parent material.
Haubstadt	Nearly level to gently sloping.	Moderately well drained.	10–12	Silt loam	Stratified silt and light silty clay loam with thin strata of fine sand of Illinoian age.
Jennings	Gently sloping to strongly sloping.	Well drained	(3)	Loess, 12 to 30 inches thick.	Illinoian glacial till that extends to depths of 3 to 6 feet and is underlain by dark-brown, acid, bituminous shale that is partly decomposed.
Jennings (heavy substratum).	Gently sloping to steep.	Well drained	(4)	Loess, 0 to 24 inches thick.	Glacial till over neutral, grayish-green soft clay shale.
Otwell	Gently sloping to steep.	Well drained	10–12	Silt loam	Stratified silt and light silty clay loam with thin strata of fine sand of Illinoian age.
Parke	Gently sloping to moderately steep.	Well drained	10–15	Loess, 18 to 40 inches thick.	Reddish, sandy and gravelly Illinoian outwash; contains considerable finer textured material.
Rossmoyne	Nearly level to sloping.	Moderately well drained.	10+	Loess, 10 to 40 inches thick.	Illinoian glacial till that extends to depths of 10 to 12 feet.
Wellston	Gently sloping to steep.	Well drained	2–3	Loess, 0 to 24 inches thick.	Acid, brown shale; siltstone; and sandstone.
Red-Yellow Podzolic soils (intergrade to Gray-Brown Podzolic soils):					
Tilsit	Nearly level to gently sloping.	Moderately well drained.	3–10	Loess, 18 to 48 inches thick.	Acid, brown shale; siltstone; and sandstone.
Trappist	Gently sloping to moderately steep	Well drained	4⅓+	Loess; Illinoian till in places.	Dark-brown to black, strongly acid shale.
Trappist (moderately well drained).	Nearly level to gently sloping.	Moderately well drained.	4⅓+	Loess; Illinoian till in places.	Dark-brown to black, strongly acid shale.
Zanesville	Gently sloping to steep.	Well drained	3–10	Loess, 18 to 48 inches thick.	Acid, brown shale; siltstone; and sandstone.
Sols Bruns Acides (intergrade to Lithosols):					
Kinderhook	Sloping to steep	Moderately well drained to well drained.	1⅔	Very thin loess or moderately heavy, weathered parent rock.	Neutral, grayish-green shale.
Muskingum	Steep to very steep	Excessively drained	1⅔	Medium-textured, weathered parent rock.	Stratified, acid sandstone; siltstone; and shale.

INTRAZONAL SOILS

Great soil group and soil series	Relief	Drainage	Depth of leaching [2]	Surface material	Underlying material
Planosols:					
Avonburg	Nearly level to gently sloping.	Imperfectly drained	10+	Loess, 40 to 80 inches thick.	Illinoian glacial till that extends to depths of 10 to 12 feet.
Clermont	Nearly level to depressional.	Poorly drained	10+	Loess, 36 to 80 inches thick.	Illinoian glacial till.

See footnotes at end of table.

TABLE 6.—*Classification of soil series by higher categories and factors that have contributed to differences in soil morphology* [1]

INTRAZONAL SOILS—Continued

Great soil group and soil series	Relief	Drainage	Depth of leaching [2]	Surface material	Underlying material
Dubois	Nearly level to gently sloping.	Imperfectly drained	10–12	Silt loam	Stratified silt and light silty clay loam with thin strata of fine sand of Illinoian age.
Johnsburg	Nearly level	Imperfectly drained	3–10	Loess, 18 to 48 inches thick.	Acid, brown shale and sandstone.
Robinson	Nearly level	Poorly drained	10–12	Silt loam	Stratified silt and light silty clay loam with thin strata of fine sand of Illinoian age.
Whitcomb	Nearly level to gently sloping.	Imperfectly drained	3–6	Loess, 12 to 30 inches thick.	Illinoian glacial till; dark-brown to black acid shale at depths of 3 to 6 feet.
Low-Humic Gley soils (intergrade to Alluvial soils):					
Atkins	Nearly level	Poorly drained	0	Medium-textured material deposited by water.	Mixed alluvial materials washed from soils that formed in Illinoian glacial drift, loess, acid sandstone, and shale.

AZONAL SOILS

Great soil group and soil series	Relief	Drainage	Depth of leaching [2]	Surface material	Underlying material
Alluvial soils (central concept):					
Haymond	Nearly level to gently sloping.	Well drained	0	Medium-textured material deposited by water.	Mixed nearly neutral alluvial materials washed from soils that formed in Illinoian glacial till, loess, sandstone, neutral grayish-green shale, and limestone.
Philo	Nearly level to gently sloping.	Moderately well drained.	0	Medium-textured material deposited by water.	Mixed acid alluvial materials washed from soils that formed in Illinoian glacial till, loess, acid sandstone, and shale.
Pope	Nearly level	Well drained	0	Medium-textured material deposited by water.	Mixed acid alluvial materials washed from soils that formed in Illinoian glacial till, loess, acid sandstone, and shale.
Wilbur	Nearly level to gently sloping.	Moderately well drained.	0	Medium-textured material deposited by water.	Mixed nearly neutral alluvial materials washed from soils that formed in Illinoian glacial till, loess, sandstone, neutral grayish-green shale, and limestone.
Alluvial soils (intergrade to Low-Humic Gley soils):					
Stendal	Nearly level	Imperfectly drained	0	Medium-textured material deposited by water.	Mixed acid alluvial materials washed from soils that formed in Illinoian glacial till, loess, acid sandstone, and shale.
Wakeland	Nearly level	Imperfectly drained	0	Medium-textured material deposited by water.	Mixed nearly neutral alluvial materials washed from soils that formed in Illinoian glacial till, loess, sandstone, neutral grayish-green shale, and limestone.
Lithosols:					
Colyer	Steep to very steep	Excessively drained	1⅜	Thin loess and weathered parent rock.	Dark-brown or black, acid shale.

[1] The factors of climate and vegetation are relatively uniform in their effect on soil formation in Scott County. The Gray-Brown Podzolic soils that intergrade to Red-Yellow Podzolic show some influence of more precipitation and higher temperature than do normal Gray-Brown Podzolic soils.

[2] The removal of materials in solution, mainly carbonates, by the passage of water through soil. The subsoil contains some of these materials.

[3] Soil leached to bedrock.

[4] Soil leached to neutral shale.

compact fragipan in the lower part of the profile. The Johnsburg soils occur in upland areas and have developed in loess that extends to depths of 18 to 48 inches. The loess is underlain by materials weathered from stratified, acid sandstone and shale.

The poorly drained soils of this group are of the Clermont and Robinson series. The Clermont soils occur on the uplands and developed in loess that extends to depths of 36 to 80 inches. The loess is underlain by Illinoian till.

The Robinson soils, which occur on terraces, are somewhat similar to the Clermont soils. The Robinson soils developed in a thin mantle of silt and are underlain by mixed, stratified alluvial deposits of silty clay loam and light silty clay loam materials that are chiefly lacustrine materials, of Illinoian age, mixed with local materials.

Low-Humic Gley soils, intergrading to Alluvial soils

Low-Humic Gley soils are poorly drained soils that have a thin, moderately dark surface horizon and a highly mottled subsoil. They formed in slight depressions and in broad level areas where water tends to pond and where internal drainage or surface drainage is very poor. Some of these soils developed in acid materials or in material low in lime in ponded areas.

The Atkins soils are the only Low-Humic Gley soils in Scott County, and they intergrade to Alluvial soils. They are developing in strongly acid, alluvial materials that washed from soils of the uplands. In some places, the lower horizons are silty clay loam; in others, the entire profile is silt loam. Although their chief characteristics cause them to be classified as Low-Humic Gley soils, the Atkins soils also have characteristics of the Alluvial soils. They are developing on wet flood plains where deposition occurs periodically each year.

Alluvial soils

The Alluvial great soil group consists of soils that are developing in transported and recently deposited alluvial material. They have little or no profile development and receive fresh deposits of sediment during each flood. The profile characteristics of these soils are determined largely by the kinds of sediments deposited.

In Scott County, the soils of the central concept in the Alluvial great soil group are in the Haymond, Philo, Pope, and Wilbur series. The differences in these soils are mainly the result of natural drainage and of the various kinds of alluvium. These various kinds of alluvium cause the soils to differ in acidity, or soil reaction.

The well-drained soils of this group are in the Haymond and Pope series. The Haymond soils are medium acid to neutral in reaction, but the Pope soils are normally strongly acid.

The moderately well drained soils of this group are in the Philo and Wilbur series. The Philo soils are normally strongly acid to very strongly acid, and the Wilbur soils are medium acid to neutral in reaction.

Alluvial soils, intergrading to Low-Humic Gley soils

The Stendal and Wakeland soils in Scott County have been placed in this group. Their chief characteristics cause them to be classified as Alluvial soils, but they have some of the characteristics of the Low-Humic Gley soils, chiefly periodic waterlogging and mottling.

The Stendal soils are strongly acid, whereas the Wakeland soils are medium acid to neutral. The Stendal soils in Scott County have lighter colored surface layers than those in the Wakeland soils.

Lithosols

Lithosols have no clearly expressed soil morphology. They consist of a freshly or imperfectly weathered mass of soil fragments. They are largely in hilly or steep areas. Soils that are very shallow over bedrock and have very weakly developed profiles are in this great soil group. Geologic erosion almost keeps pace with the weathering of the rocks.

In Scott County the Colyer soils are classified as Lithosols. The Colyer soils developed in residuum from dark-brown to black, acid shale. The depth to weathered shale ranges from 6 to 18 inches. In some places, a few pebbles of glacial till are scattered on the surface.

Additional Facts About the County

This section is provided primarily for those who are not familiar with Scott County. It gives some general information about vegetation, climate, drainage, water supply, transportation, industry, cultural facilities, and agriculture of the county.

Vegetation

The native vegetation of the county consisted of trees and shrubs. Dense stands of valuable trees grew on the fertile soils, but many of the soils were poorly suited to trees and supported only shrubs and dwarfed trees. The native trees were mostly the deciduous hardwoods: yellow-poplar, oak, pin oak, hickory, elm, beech, maple, ash, and sweetgum. Undesirable vegetation included raspberry, wild plum, sumac, rose, and briers.

All of Scott County used to be woodland, but many areas have been cleared and converted to cropland. Only about 35 percent of the county is now in woods.

Climate

Scott County has an invigorating climate with ample rainfall and frequent changes of temperature and humidity. The county is far inland, and the weather is not influenced by oceans. Low-pressure centers are formed when polar air and tropical air meet in the area. These centers move across the plains and cause storms. Most of the rainfall and changes in temperature and humidity are results of these storms. Table 7 shows the annual temperature and precipitation recorded at the United States Weather Bureau station in Scottsburg.

The average date of the last killing frost in spring is April 16; that of the first killing frost in fall is October 18. The average frost-free period is 185 days. Killing frost in some years has occurred as late as May 25 and as early as September 24.

Between 1951 and 1956, the number of days per year that had temperatures of 90° F. or higher ranged from 29

TABLE 7.—*Temperature and precipitation at Scottsburg, Scott County, Indiana*

[Elevation, 565 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1930)	Wettest year (1950)	Average snowfall
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December	35.2	73	—22	3.40	2.34	2.75	3.8
January	33.1	78	—26	4.04	4.65	11.96	4.6
February	34.3	80	—32	2.68	2.62	6.89	4.2
Winter	34.2	80	—32	10.12	9.61	21.60	12.6
March	44.8	88	—2	4.28	1.62	3.80	2.5
April	54.7	93	18	3.87	1.69	6.38	.3
May	64.7	99	27	3.81	.65	7.62	[3]
Spring	54.7	99	—2	11.96	3.96	17.80	2.8
June	73.5	107	40	3.89	2.06	6.21	0
July	77.5	109	45	3.42	1.16	3.91	[3]
August	75.9	107	42	3.47	2.78	3.71	0
Summer	75.6	109	40	10.78	6.00	13.83	[3]
September	69.8	106	23	2.90	3.91	5.18	[3]
October	57.2	94	14	2.91	1.43	3.13	.1
November	44.9	86	—1	3.00	1.79	5.89	.6
Fall	57.3	106	—1	8.81	7.13	14.20	.7
Year	55.5	109	—32	41.67	26.70	67.43	16.1

[1] Average temperature based on a 61-year record, through 1955; highest and lowest temperatures on a 56-year record, through 1952.
[2] Average precipitation based on a 61-year record, through 1955; wettest and driest years based on a 59-year record, in the period 1895-1955; snowfall based on a 55-year record, through 1952.
[3] Trace or no record.

to 72, and the number of days per year that had temperatures below zero ranged from 0 to 9.

In this period, 0.5 or more inches of rain fell in 23 to 37 days per year. In 1953 there were five 1-inch rains, and in 1955 and again in 1956, there were fourteen 1-inch rains. The average snowfall in a 55-year period that ended in 1952 was 16.1 inches.

Water Supply

In most places in the county, not enough water can be obtained from dug wells, drilled wells, or springs to supply all the needs for domestic and farm use.[7] The flow of water from springs is not sufficient, and the water in many drilled wells is mineral water too strong or salty to drink. Cisterns have been built in some places, but when rainfall is scarce, water must be hauled from Scottsburg to many places.

Most of the water supply is now stored in reservoirs, lakes, and ponds. On farms, a ¼-acre pond can normally supply enough water for home use and livestock. A farmer who has water stored in a pond can increase the number of his livestock, and he can stock fish for food and recreation (fig. 21).

Before you choose a location for a farm pond, you should have a qualified technician make detailed investigations of the proposed site. The local representative of the Soil Conservation Service will help you.

Lakes and ponds in the county total 540 acres. One large lake near Scottsburg covers 100 acres, and some privately owned lakes are larger than 10 acres. Farm ponds built for water supply, fire protection, and wildlife habitats are an acre or less in size. Many of these are stocked with bass and bluegill.

Drainage

Figure 22 shows that the East Fork of the Muscatatuck River and its many tributaries drain almost all of Scott County. This river is the northern and northwestern boundary of the county. Smaller streams that drain the rest of the county are also shown in figure 22.

The East Fork Muscatatuck River is bordered by broad bottom lands that are likely to be flooded periodically. The northern part of the county is drained by Quick Creek and White Oak Branch, two large tributaries of the East Fork Muscatatuck River. These streams are in small, narrow valleys that have short, steep slopes. Near the river, the valleys and bottom lands widen and the surrounding areas are gently sloping to undulating.

Hutto Creek and Flat Creek drain the north-central part of the county and empty into Stucker Fork at points south of Austin. Many small streams and shallow valleys are in the nearly level upland areas around Austin and Scottsburg. The valleys range from a few rods to about 1 mile in width.

Hog Creek, Woods Fork, and Town Creek drain the east-central part of the county. The heads of Kimberlin Creek and Newland Creek are in the Clark Military Grant. Kimberlin Creek empties into Stucker Fork about 1½ miles east of Scottsburg.

The southeastern part of the county is rolling and sloping. The high upland areas drained by Kimberlin and Newland Creeks are strongly sloping to steep. The

Figure 21.—**Ponds and lakes provide water for livestock and good fishing.**

[7] HARRELL, MARSHALL. GROUND WATER IN INDIANA. Ind. Dept. of Cons., Div. of Geol., 504 pp. illus., Pub. 133. 1935.

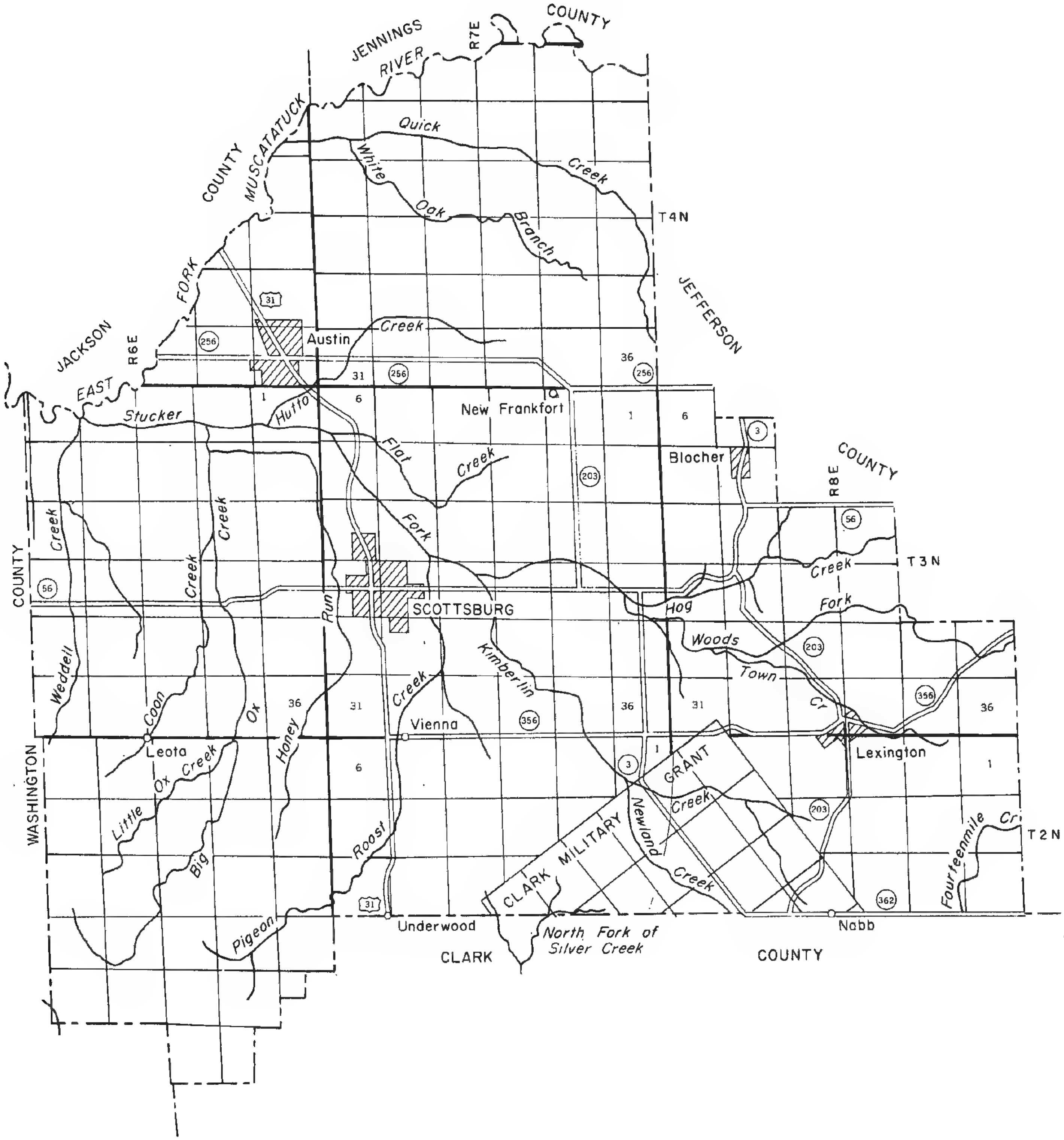

Figure 22.—**Drainage of Scott County, Ind.**

bottom lands are narrow and shallow to bedrock along the upper parts of the streams, but as the streams flow northwestward, the bottom lands become wider.

Pigeon Roost Creek heads in the southwestern part of the county, traverses the south-central part, and empties into Stucker Fork near Scottsburg. It drains much of the area east of that drained by Big Ox Creek and its tributaries.

The Knobstone hills in the southwestern part of the county have the highest elevations in the county. These hills were formed by streams that have developed deep V-shaped valleys, 1 to 5 miles wide. As Pigeon Roost, Big Ox, and Little Ox Creeks approach the more rolling areas, their valleys broaden and the slopes of the surrounding hills become milder.

Weddell Creek flows northward near the western boundary of the county and empties into the East Fork Muscatatuck River. It is about 5 miles long and has a fork and two narrow valleys. These valleys are shallow in their upper parts and contain sediments in their lower part. The lower part of the main valley has been built up by sediments that are as much as 20 feet thick in some places.

Transportation

The main line of the Pennsylvania Railroad runs north and south through Scottsburg, the county seat. A branch line of the Baltimore and Ohio Railroad passes through Lexington in the eastern part of the county. One Federal highway and several State roads serve the county. U.S. Highway No. 31 runs north and south through Scottsburg, and State Highway No. 56 runs east and west through that city. State Highways 256 and 356 cross the county in an east and west direction. No. 256 runs through Austin, and No. 356 runs through Lexington. State Highways 3 and 203 run north and south through the eastern part of the county. All roads provide excellent transportation to markets.

Industries

At least three-fourths of the people in Scott County work part or full time in industrial plants. But the county is primarily agricultural.

The largest industry in the county is a privately owned cannery. It employs approximately 1,000 workers on a year-round basis, and employment is doubled in summer when fresh vegetables are processed. Among other industries are factories that manufacture clothing, television sets, cans, aluminum doors and windows, concrete products, and building materials. Several small sawmills and semipermanent sawmills supply lumber and building materials for homes and other structures.

A large stone quarry is at the junction of State Highways Nos. 203 and 56 in section 20, T. 3 N., R. 8 E. This quarry supplies rock for construction purposes. Scattered over the eastern part of the county are several small shale pits or quarries, which are inactive. Some of the quarries have water in them the year round; others are dry. These pits and quarries are useful only as habitats for wildlife or for recreation. Quarries make up a total of 36 acres in the county.

Early History

The first settlement of any importance in the area that is now Scott County was made in 1809 at Pigeon Roost. Before 1809, attempts were made to settle the area, but settlement was prevented by hostile Indians. The settlement at Pigeon Roost was practically destroyed and its inhabitants massacred in 1812.

Scott County was organized in 1820. The county seat was first at Lexington but was later transferred to Scottsburg, which is nearer the center of the county. Most of the early settlers in the area came from Kentucky, Tennessee, North Carolina, and Virginia.

Cultural Facilities and Trends

In the 20-year period from 1930 to 1950, the population in Scott County increased from 6,664 inhabitants to 11,519, or 57.8 percent. Many social changes have occurred in this period.

Electricity and telephone services have been made available in most communities. In the preservation of food, modern refrigerators and deep freezers have replaced old-fashioned iceboxes, spring houses, and cellars.

The one-room country school has given way to consolidated elementary and high schools. Buses transport children to school from all parts of the county. The high schools have seven vocational departments. Three of these are in agriculture, two in home economics, and two in industrial arts.

There are a number of new churches in the county, and many of the old ones have been renovated. The churches own their parsonages. A new county hospital has been built. Recreational facilities and local improvements are provided by civic and social organizations in the county. The outstanding social event of the year is the annual county fair. County organizations are continually working to improve habitats for wildlife and to increase the number of birds, animals, and fish in the county.

The Scott County Soil Conservation District was organized in 1945. Farmers in the county are active members of this organization and, in cooperation with several agricultural agencies, have established pastures, planted trees and managed woodland profitably, constructed farm ponds, and improved habitats for wildlife. To conserve water and help control erosion, farmers have laid tile lines, constructed diversion ditches and terraces, built reservoirs, and developed waterways. Agricultural agencies have helped farmers arrange loans for farm improvements and have helped them plan their farms, improve cropping systems, and control erosion.

Agriculture

Agriculture is the main occupation in Scott County. Before 1880, lumber and wood products provided most of the income, but the lumber industry steadily declined as the virgin timber supply was depleted. Timber stands were poor and trees grew slowly in many places because the soils were poor.

The eastern part of the county was first cleared and cultivated. Here the soils were well drained and best suited to crops. The early settlers grew corn, wheat, and potatoes for home use. Until recently, the stream valleys and level areas in the county were too wet for farming, but tile drainage has made these areas productive.

Crops

Table 8 gives the acreage of the principal crops for stated years and the number of bearing fruit trees and

TABLE 8.—*Acreage of principal crops, and number of fruit trees and grapevines of bearing age in stated years*

Crop	1929	1939	1949	1954
	Acres	*Acres*	*Acres*	*Acres*
Corn, total	12, 966	12, 167	12, 872	15, 096
Wheat threshed or combined	2, 906	3, 526	4, 898	4, 642
Oats threshed or combined	886	627	1, 004	1, 790
Barley threshed or combined		24	296	491
Rye threshed or combined	40	88	225	564
Soybeans for all purposes	951	4, 388	5, 334	4, 326
Hay crops, total	8, 339	8, 420	6, 557	6, 069
Alfalfa	92	430	289	519
Clover and timothy	5, 737	2, 732	1, 736	3, 140
Lespedeza	(1)	1, 272	3, 988	1, 867
Small grain	247	79	137	280
Other hay	2, 263	3, 907	407	263
Vegetables harvested for home use or for sale	2, 482	1, 706	735	2, 206
Cabbage	67	36	92	178
Sweet corn	5	268	443	1, 756
Tomatoes	2, 124	1, 372	193	206
	Number [2]	*Number* [2]	*Number* [2]	*Number*
Apple trees	10, 034	7, 424	3, 204	1, 813
Peach trees	8, 200	2, 836	1, 299	286
Pear trees	722	479	151	54
Cherry trees	422	556	151	51
Plum and prune trees	417	460	151	72
Grapevines	1, 772	1, 406	502	256

[1] Not reported.
[2] One year later than year given at head of column.

grapevines. Corn and wheat have been the principal grain crops for many years; barley, oats, and rye are grown less extensively but are increasing in acreage. The acreages in orchards, vineyards, and tomatoes have decreased markedly since 1929. Between 1949 and 1954, however, the acreage in tomatoes has increased. Tomatoes are an important cash crop.

Large acreages of soybeans have been grown commercially in the past few years. Sweet corn, pumpkins, and cabbage are sold to canneries.

Livestock

Livestock is an important source of farm income. Table 9 gives the number of livestock on farms in Scott County in stated years. The total number of cattle has steadily increased in the last few years, but the number of hogs and pigs has fluctuated because of variations in grain prices. Laying hens on farms have decreased in number. Most flocks, however, are now raised commercially rather than in small numbers on farms, and more chickens are processed by the broiler industry. Farms have been mechanized, and the number of horses and mules has noticeably decreased.

TABLE 9.—*Livestock of all ages in stated years*

Livestock	1930	1940	1950	1954
	Number	*Number*	*Number*	*Number*
Horses and mules	2, 304	[1] 2, 041	1, 101	501
Cattle and calves	3, 974	[1] 4, 582	5, 999	7, 527
Milk cows	2, 089	2, 326	2, 438	2, 424
Steers and bulls	[2] 269	(3)	[2] 678	1, 454
Hogs and pigs	3, 852	[4] 4, 154	9, 597	7, 911
Sheep and lambs	1, 548	[5] 1, 667	1, 470	1, 541
Chickens	[1] 71, 643	[4] 59, 430	[4] 67, 194	[4] 59, 860

[1] Over 3 months old.
[2] One year earlier than year given at head of column.
[3] Not reported
[4] Over 4 months old.
[5] Over 6 months old.

Size, tenure, and type of farms

Between 1930 and 1954, the number of farms in the county decreased from 1,034 to 926, and the acreage in farms, from 94,879 to 88,906. The average size of farm has changed very little. In 1930, the average farm contained 91.8 acres, and in 1954 it contained 96.0 acres.

Full owners of farms have decreased in number from 686 in 1930 to 672 in 1954. In contrast, the number of part owners increased from 106 in 1930 to 184 in 1954. Tenancy has dropped about 70 percent in this period, and the number of managers reported has dropped from 14 to 2.

Farms in the county in 1950 and 1954 are listed by type as follows:

	1950	*1954*
Field crop farms	73	141
Cash-grain	44	126
Other field crop	29	15
Vegetable farms	5	---
Dairy farms	63	35
Poultry farms	49	30
Livestock farms other than dairy and poultry	205	176
General farms	141	125
Primarily crop	10	5
Primarily livestock	58	25
Crop and livestock	73	95
Miscellaneous and unclassified farms	377	419
Total	913	926

Farm investments, expenditures, and labor

In 1949, farmers spent \$170,400 for labor and machine hire, \$429,770 for feeds, and \$105,319 for gasoline and other fuel. In 1954 they spent \$185,300 for labor and machine hire, \$715,510 for feeds, \$158,680 for gasoline and other fuel. They also spent \$200,385 for commercial fertilizer and lime in 1954.

Only 20 to 25 percent of the farmers in Scott County depend entirely on farming for their livelihood. Most farm workers must supplement their income by working in factories. Farm labor comes from the rural areas of the county or from migratory workers, but this labor is scarce when factory work is at its peak. Wages for work on farms are consistently lower than in industry, and farm workers are available only when factory work is slack or is not available.

Glossary

Acidity. (See Reaction.)

Alluvial soils. An azonal group of soils that developed from transported and relatively recently deposited material (alluvium), characterized by weak or no modification of the original material by soil-forming processes.

Azonal soils. A general group of soils having little or no soil profile development. Most of them are young.

Consistence, soil. The attributes of soil material that are expressed by the degree and kind of cohesion and adhesion or by the resistance to deformation or rupture. Terms commonly used to describe consistence are *brittle, compact, firm, friable, plastic, sticky, stiff,* and *tight.*

Contour. An imaginary line on the surface of the earth connecting points of the same elevation.

Contour farming. Plowing, planting, cultivating, harvesting, and doing other fieldwork on the contour or at right angles to the natural direction of slope.

Core trench. Trench that is dug along the approximate centerline of a dam to prevent seepage by cutting old tile lines and sand or gravel streaks. This trench is built before the dam is constructed.

Deciduous forest. Forest of trees that shed all their leaves in winter.

Drift. Material of any sort deposited by geological processes in one place after having been removed from another. Glacial drift includes the materials deposited by glaciers and by the streams and lakes associated with them.

Erosion. The wearing away of the land surface by detachment and transport of soil and rock materials through the action of moving water, wind, or other geological agents.

Fertility, soil. The presence in a soil of the necessary elements, in sufficient amounts, in the proper balance, and available for the growth of specified plants, when other factors, such as light, temperature, and the physical condition of the soil, are favorable.

First bottom. The normal flood plain of a stream. Some first-bottom areas are flooded frequently, others at less frequent intervals. The term "high bottom phase" is commonly applied to areas that are rarely flooded. (See also Flood plain.)

Flood plain. Nearly level land occupying the bottom of the valley of a present stream and subject to flooding unless protected artificially.

Fragipan. A dense and brittle pan, or layer, that owes its hardness mainly to extreme density or compactness rather than to content of much clay or cementation. Fragments that are removed are friable, but the material in place is so dense that roots cannot penetrate it and water moves through it very slowly by following vertical channels and cleavage planes.

Genesis (soil). Mode of origin of the soil. Soil genesis refers particularly to the processes causing the development of the solum from unconsolidated parent materials.

Gray-Brown Podzolic soils. A zonal group of soils that have thin, organic coverings and thin, organic-mineral layers over grayish-brown, leached layers. The leached layers are underlain by brown B horizons that are richer in clay than the horizons above them. These soils have formed under deciduous forest in a moist, temperate climate.

Great soil group (Soil classification). A broad group of soils that have common internal soil characteristics.

Horizon, soil. A layer of soil, approximately parallel to the soil surface, with characteristics produced by soil-forming processes.

Horizon A. The master horizon consisting of (1) one or more mineral horizons of maximum organic accumulation; or (2) surface or subsurface horizons that are lighter in color than the underlying horizon and that have lost clay minerals, iron, and aluminum with resultant concentration of the more resistant minerals; or (3) horizons belonging to both of these categories.

Horizon B. The master horizon of altered material characterized by (1) an accumulation of clay, iron, or aluminum, with accessory organic material; or (2) more or less blocky or prismatic structure together with other characteristics, such as stronger colors, unlike those of the A horizons or the underlying horizons of nearly unchanged material; or (3) characteristics of both these categories. Commonly, the lower limit of the B horizon corresponds to the lower limit of the solum.

Horizon C. A layer of unconsolidated material, relatively little affected by the influence of organisms and, in chemical, physical, and mineralogical composition, presumed to be similar to the material from which at least a part of the overlying solum has developed.

Horizon D. Any stratum underlying the C, or the B if no C is present, which is unlike the C, or unlike the material from which the solum has formed.

Immature soil. A soil lacking clear individual horizons because of the relatively short time for soil-building forces to act upon the parent material since its deposition or exposure.

Impervious soil. A soil resistant to penetration by water and usually to penetration by air and roots.

Intrazonal soil. Any one of the great groups of soils having more or less well-developed soil characteristics that reflect a dominating influence of some local factor of relief or parent material over the normal influences of climate and vegetation.

Lacustrine deposits. Materials deposited in the waters of lakes and exposed by the lowering of the water level or by the elevation of the land.

Leaching. The removal of soluble constituents from soils or other materials by percolating water.

Lithosols. An azonal group of soils that have had little or no soil development and that consist mainly of a partly weathered mass of rock fragments or of nearly barren rock.

Loess. Geological deposit of fairly uniform, fine material, mostly silt, presumably transported by the wind.

Low-Humic Gley soils. An intrazonal group of imperfectly drained to poorly drained soils with very thin surface horizons, moderately high in organic matter, that are underlain by mottled gray and brown gleylike mineral horizons with a low degree of textural differentiation.

Mineral water. Water that contains impurities such as sulfur and salts.

Moisture-supplying capacity. The amount of moisture a soil holds that roots can withdraw.

Morphology, soil. The physical constitution of the soil, including the texture, structure, consistence, color, and other physical and chemical properties of the various soil horizons that make up the soil profile.

Mottled. Marked with spots of color and usually associated with poor drainage. Descriptive terms for mottles follow: Contrast—*faint, distinct,* and *prominent;* abundance—*few, common,* and *many;* and size—*fine, medium,* and *coarse.* The size measurements are as follows: *Fine,* commonly less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* commonly ranging between 5 and 15 millimeters (about 0.2 to 0.6 inch) along the greatest dimension; and *coarse,* commonly more than 15 millimeters (about 0.6 inch) along the greatest dimension.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in elaboration of its food and tissue.

Order, soil. The highest category in soil classification. The three soil orders are zonal soils, intrazonal soils, and azonal soils.

Parent material, soil. The horizon of weathered rock or partly weathered soil material from which the soil is formed. Horizon C of the soil profile.

Permeability, soil. That quality of the soil that enables it to transmit air and water. Moderately permeable soils transmit air and water readily. Such conditions are favorable for the growth of roots. Slowly permeable soils allow water and air to move so slowly that root growth may be restricted. Rapidly permeable soils transmit air and water rapidly. Root growth is good.

pH. (See Reaction.)

Phase, soil. That subdivision of a soil type having variations in characteristics not significant to the classification of the soil in its natural landscape but significant to the use and management of the soil. The variations are chiefly in such external characteristics as relief, stoniness, or erosion.

Planosols. An intrazonal group of soils with eluviated surface horizons underlain by claypans or fragipans, developed on nearly flat or gently sloping uplands in humid or subhumid climates.

Plow layer. That part of the soil profile in which tillage takes place.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. (See Horizon, soil.)

Reaction, soil. The degree of acidity or alkalinity of the soil mass, expressed in either words or in pH values, as follows:

	pH
Extremely acid	below 4. 5
Very strongly acid	4. 5–5. 0
Strongly acid	5. 1–5. 5
Medium acid	5. 6–6. 0
Slightly acid	6. 1–6. 5
Neutral	6. 6–7. 3
Mildly alkaline	7. 4–7. 8
Moderately alkaline	7. 9–8. 4
Strongly alkaline	8. 5–9. 0
Very strongly alkaline	9.1 and higher.

Red-Yellow Podzolic soils. A zonal group of well-drained soils that have thin, organic and organic-mineral horizons over a light-colored, bleached horizon that, in turn, is over a red, yellowish-red, or yellow horizon, which is more clayey than the horizon above. Parent materials are more or less siliceous. Coarse, reticulate streaks or mottles of red, yellow, brown, and light gray occur in deep horizons where parent materials are thick.

Relief. Elevations or inequalities of the land surface, considered collectively.

Residual soil. Soil formed in place by the disintegration and decomposition of rocks and the consequent weathering of the mineral materials. A residual soil presumably developed from the same kind of rock as that on which it lies.

Root zone. That part of the soil invaded or subject to invasion by plant roots under normal conditions.

Runoff. Surface drainage of rain or melted snow. Terms commonly used to describe runoff are *very slow, slow, medium, rapid,* and *very rapid.*

Series, soil. A group of soils that, except for the texture of the surface soil, have genetic horizons similar as to differentiating characteristics and arrangement in the soil profile, and developed from a particular type of parent material. A series may include two or more soil types that differ from one another in the texture of the surface soil.

Slope, land. The inclination of the land surface from the horizontal. Usually expressed as a percentage for soil conservation work. Can be expressed in degrees.

$$\text{Percent slope} = \frac{\text{Vertical distance}}{\text{Horizontal distance}} \times 100.$$

Solum, soil. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soils includes the A and B horizons. Usually, the characteristics of the material in these horizons are unlike those of the underlying parent material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Sols Bruns Acides. A zonal group of soils that have a thin A_1 horizon and an A_2 horizon that is poorly differentiated and is underlain by a B_2 horizon with uniform color; weak, subangular blocky structure; and silicate clay that is not evident or appears only in traces. The sola of these soils are generally moderately coarse to medium textured, but they are coarse textured in some places. Fragipans occur in many places and may have a distinct accumulation of clay and much higher base saturation than the horizons above.

Stratified. Composed of, or arranged in, strata, or layers, such as stratified alluvium. The term is confined to geological materials. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The aggregation of primary soil particles into compound particles, or clusters of primary particles, which are separated from adjoining aggregates by surfaces of weakness. Soil structure is classified according to grade, class, and type.

Grade. Degree of distinctness of aggregation. Grade expresses the differential between cohesion within aggregates and adhesion between aggregates. Terms: *Structureless* (single grain or massive), *weak, moderate;* and *strong.*

Class. Size of soil aggregates. Terms: *Very fine* or *very thin, fine* or *thin, medium, coarse* or *thick,* and *very coarse* or *very thick.*

Type. Shape and arrangement of individual natural soil aggregates. Terms: *Platy, prismatic, columnar, blocky, subangular blocky, granular,* and *crumb.*

Subsoil. Technically, the B horizon of soils with distinct profiles; commonly, that part of the profile below plow depth.

Surface soil. Technically, the A horizon; commonly, the upper part of the profile usually stirred by plowing.

Terrace. An embankment or ridge constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff in order to retard it for infiltration into the soil and so that any excess may flow slowly to a prepared outlet without harm.

Terrace, (geological). A nearly flat or undulating plain, commonly rather narrow and usually with a steep front, bordering a river, a lake, or the sea. Although many old terraces have become more or less hilly through dissection by streams, they are still regarded as terraces.

Texture, soil. The relative proportions of the various size groups of individual soil grains in a mass of soil; specifically, the proportions of sand, silt, and clay. The soil texture classes, in increasing order of the content of the finer separates, are as follows: *Sand, loam, silt,* and *clay.* These classes may be modified according to relative size of the coarser particles, for example, *fine sand, loamy fine sand, fine sandy loam, very fine sandy loam, coarse sandy loam, gravelly sandy loam, gravelly loam, cobbly loam, sandy clay, stony clay,* and *stony loam.*

Till, or glacial till. A generally unstratified, unconsolidated, heterogeneous mixture of clay, silt, sand, gravel, and boulders.

Tilth, soil. The physical condition of the soil in its relation to plant growth, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Type, soil. A subdivision of the soil series based on the texture of the surface soil.

Watershed. (1) The total land area, regardless of size, above a given point on a waterway that contributes runoff water to the flow at that point, (2) a major drainage-area subdivision of a drainage basin. On the basis of this concept, the United States is generally divided into some 150 watersheds.

Weathering. The physical and chemical disintegration and decomposition of rocks and minerals.

Zonal soils. Soils having well-developed characteristics that reflect the influence of the active factors of soil formation. The active factors are climate and living organisms, chiefly vegetation.

GUIDE FOR MAPPING UNITS

[See table 2, p. 43, for estimated productivity ratings of each soil, and table 1, p. 6, for approximate acreage and proportionate extent of the soils]

Map symbol	*Mapping unit*	*Page*	*Capability unit*	*Page*
At	Atkins silt loam	5	Vw-1	40
AvA	Avonburg silt loam, 0 to 2 percent slopes	7	IIw-1	35
AvB	Avonburg silt loam, 2 to 6 percent slopes	7	IIw-1	35
AvB2	Avonburg silt loam, 2 to 6 percent slopes, moderately eroded	7	IIw-1	35
CaA	Cana silt loam, 0 to 2 percent slopes	8	I-1	33
CaB	Cana silt loam, 2 to 6 percent slopes	8	IIe-1	34
CaB2	Cana silt loam, 2 to 6 percent slopes, moderately eroded	8	IIe-1	34
CbB3	Cana soils, 2 to 6 percent slopes, severely eroded	8	IVe-1	38
CcB	Cincinnati silt loam, 2 to 6 percent slopes	9	IIe-1	34
CcB2	Cincinnati silt loam, 2 to 6 percent slopes, moderately eroded	9	IIe-1	34
CcC	Cincinnati silt loam, 6 to 12 percent slopes	9	IIIe-1	36
CcC2	Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded	9	IIIe-1	36
CcD	Cincinnati silt loam, 12 to 18 percent slopes	9	IVe-2	39
CcD2	Cincinnati silt loam, 12 to 18 percent slopes, moderately eroded	9	IVe-2	39
CcE	Cincinnati silt loam, 18 to 25 percent slopes	10	VIe-2	41
CcE2	Cincinnati silt loam, 18 to 25 percent slopes, moderately eroded	10	VIe-2	41
CcF	Cincinnati silt loam, 25 to 35 percent slopes	10	VIIe-3	42
CcF2	Cincinnati silt loam, 25 to 35 percent slopes, moderately eroded	10	VIIe-1	41
CeC3	Cincinnati soils, 6 to 12 percent slopes, severely eroded	10	IVe-1	38
CeD3	Cincinnati soils, 12 to 18 percent slopes, severely eroded	10	VIe-1	40
CeE3	Cincinnati soils, 18 to 25 percent slopes, severely eroded	10	VIIe-2	42
Cm	Clermont silt loam	11	IIIw-1	38
CoE	Colyer soils, 12 to 25 percent slopes	11	VIIe-3	42
CoF	Colyer soils, 25 to 60 percent slopes	11	VIIe-3	42
DbA	Dubois silt loam, 0 to 2 percent slopes	12	IIw-1	35
DbB	Dubois silt loam, 2 to 6 percent slopes	12	IIw-1	35
DbB2	Dubois silt loam, 2 to 6 percent slopes, moderately eroded	12	IIw-1	35
GaB	Grayford silt loam, 2 to 6 percent slopes	12	IIe-1	34
GaB2	Grayford silt loam, 2 to 6 percent slopes, moderately eroded	13	IIe-1	34
GaC2	Grayford silt loam, 6 to 12 percent slopes, moderately eroded	13	IIIe-1	36
GaD2	Grayford silt loam, 12 to 18 percent slopes, moderately eroded	13	IVe-2	39
GaE	Grayford silt loam, 18 to 25 percent slopes	13	VIe-2	41
GaE2	Grayford silt loam, 18 to 35 percent slopes, moderately eroded	13	VIe-2	41
GaF	Grayford silt loam, 25 to 35 percent slopes	13	VIIe-3	42
GfC3	Grayford soils, 6 to 12 percent slopes, severely eroded	13	IVe-1	38
GfD3	Grayford soils, 12 to 18 percent slopes, severely eroded	13	VIe-1	40
Gg	Gullied land, acid shale materials	13	VIIe-2	42
Gm	Gullied land, neutral shale materials	13	VIIe-2	42
Gr	Gullied land, glacial materials	13	VIIe-2	42
HaB	Haubstadt silt loam, 2 to 6 percent slopes	14	IIe-1	34
HaB2	Haubstadt silt loam, 2 to 6 percent slopes, moderately eroded	14	IIe-1	34
HbB3	Haubstadt soils, 2 to 6 percent slopes, severely eroded	14	IVe-1	38
HdA	Haymond silt loam, 0 to 2 percent slopes	14	I-2	34
HdB	Haymond silt loam, 2 to 6 percent slopes	15	I-2	34
HhA	Haymond silt loam, high bottom, 0 to 2 percent slopes	15	I-2	34
HhB	Haymond silt loam, high bottom, 2 to 6 percent slopes	15	I-2	34
JeC	Jennings silt loam, mixed substratum, 6 to 12 percent slopes	17	IIIe-1	36
JeC2	Jennings silt loam, mixed substratum, 6 to 12 percent slopes, moderately eroded	17	IIIe-1	36
JeD	Jennings silt loam, mixed substratum, 12 to 18 percent slopes	17	IVe-2	39
JeE	Jennings silt loam, mixed substratum, 18 to 25 percent slopes	17	VIe-2	41
JgC3	Jennings soils, mixed substratum, 6 to 12 percent slopes, severely eroded	17	IVe-1	38
JgD3	Jennings soils, mixed substratum, 12 to 18 percent slopes, severely eroded	18	VIe-1	40
JhB	Jennings silt loam, heavy substratum, 2 to 6 percent slopes	16	IIe-1	34
JhB2	Jennings silt loam, heavy substratum, 2 to 6 percent slopes, moderately eroded	16	IIe-1	34
JhC	Jennings silt loam, heavy substratum, 6 to 12 percent slopes	16	IIIe-1	36
JhC2	Jennings silt loam, heavy substratum, 6 to 12 percent slopes, moderately eroded	17	IIIe-1	36
JhD	Jennings silt loam, heavy substratum, 12 to 18 percent slopes	17	IVe-2	39
JhD2	Jennings silt loam, heavy substratum, 12 to 18 percent slopes, moderately eroded	17	IVe-2	39
JhE	Jennings silt loam, heavy substratum, 18 to 25 percent slopes	17	VIe-2	41
JhF	Jennings silt loam, heavy substratum, 25 to 35 percent slopes	17	VIIe-3	42
JkC3	Jennings soils, heavy substratum, 6 to 12 percent slopes, severely eroded	17	IVe-1	38
JkD3	Jennings soils, heavy substratum, 12 to 18 percent slopes, severely eroded	17	VIe-1	40
JkE3	Jennings soils, heavy substratum, 18 to 25 percent slopes, severely eroded	17	VIIe-2	42
JmB	Jennings silt loam, 2 to 6 percent slopes	15	IIe-1	34
JmB2	Jennings silt loam, 2 to 6 percent slopes, moderately eroded	15	IIe-1	34
JmC	Jennings silt loam, 6 to 12 percent slopes	15	IIIe-1	36
JmC2	Jennings silt loam, 6 to 12 percent slopes, moderately eroded	16	IIIe-1	36
JmD	Jennings silt loam, 12 to 18 percent slopes	16	IVe-2	39
JmD2	Jennings silt loam, 12 to 18 percent slopes, moderately eroded	16	IVe-2	39
JnB3	Jennings soils, 2 to 6 percent slopes, severely eroded	16	IVe-1	38
JnC3	Jennings soils, 6 to 12 percent slopes, severely eroded	16	IVe-1	38
JnD3	Jennings soils, 12 to 18 percent slopes, severely eroded	16	VIe-1	40
JrE	Jennings and Colyer silt loams, 18 to 25 percent slopes	18	VIIe-3	42
JrE2	Jennings and Colyer silt loams, 18 to 25 percent slopes, moderately eroded	18	VIIe-1	41

GUIDE FOR MAPPING UNITS—Continued

Map symbol	*Mapping unit*	*Page*	*Capability unit*	*Page*
JsE3	Jennings and Colyer soils, 18 to 25 percent slopes, severely eroded	18	VIIe-2	42
Ju	Johnsburg silt loam	18	IIw-1	35
KhD	Kinderhook silty clay loam, 12 to 18 percent slopes	19	VIIe-3	42
KhF	Kinderhook silty clay loam, 18 to 35 percent slopes	19	VIIe-3	42
Ma	Made land	19	None	—
MuF	Muskingum silt loam, 25 to 35 percent slopes	19	VIIe-3	42
MuG	Muskingum silt loam, 35 to 70 percent slopes	19	VIIe-3	42
OtB	Otwell silt loam, 2 to 6 percent slopes	20	IIe-1	34
OtC2	Otwell silt loam, 6 to 12 percent slopes, moderately eroded	20	IIIe-1	36
OtD	Otwell silt loam, 12 to 18 percent slopes	20	IVe-2	39
OtE	Otwell silt loam, 18 to 25 percent slopes	20	VIe-2	41
OwC3	Otwell soils, 6 to 12 percent slopes, severely eroded	20	IVe-1	38
OwD3	Otwell soils, 12 to 18 percent slopes, severely eroded	21	VIe-1	40
OwE3	Otwell soils, 18 to 25 percent slopes, severely eroded	21	VIIe-2	42
PaB2	Parke silt loam, 2 to 6 percent slopes, moderately eroded	21	IIe-1	34
PaC2	Parke silt loam, 6 to 12 percent slopes, moderately eroded	21	IIIe-1	36
PaD	Parke silt loam, 12 to 18 percent slopes	21	IVe-2	39
PaE	Parke silt loam, 18 to 25 percent slopes	21	VIe-2	41
PeC3	Parke soils, 6 to 12 percent slopes, severely eroded	21	IVe-1	38
PeD3	Parke soils, 12 to 18 percent slopes, severely eroded	21	VIe-1	40
PhA	Philo silt loam, 0 to 2 percent slopes	22	IIw-2	36
PhB	Philo silt loam, 2 to 6 percent slopes	22	IIw-2	36
Po	Pope silt loam	22	I-2	34
Rb	Robinson silt loam	23	IIIw-1	38
RmA	Rossmoyne silt loam, 0 to 2 percent slopes	24	I-1	33
RmB	Rossmoyne silt loam, 2 to 6 percent slopes	24	IIe-1	34
RmB2	Rossmoyne silt loam, 2 to 6 percent slopes, moderately eroded	24	IIe-1	34
RmC2	Rossmoyne silt loam, 6 to 12 percent slopes, moderately eroded	24	IIIe-1	36
RoB3	Rossmoyne soils, 2 to 6 percent slopes, severely eroded	24	IVe-1	38
RoC3	Rossmoyne soils, 6 to 12 percent slopes, severely eroded	24	IVe-1	38
St	Stendal silt loam	24	IIw-2	36
TmA	Tilsit silt loam, 0 to 2 percent slopes	25	I-1	33
TmB	Tilsit silt loam, 2 to 6 percent slopes	25	IIe-1	34
TmB2	Tilsit silt loam, 2 to 6 percent slopes, moderately eroded	25	IIe-1	34
TnB	Trappist silt loam, moderately well drained, 2 to 6 percent slopes	27	IIe-2	35
TnB2	Trappist silt loam, moderately well drained, 2 to 6 percent slopes, moderately eroded	27	IIe-2	35
TrB	Trappist silt loam, 2 to 6 percent slopes	26	IIe-2	35
TrC	Trappist silt loam, 6 to 12 percent slopes	27	IIIe-2	37
TrB2	Trappist silt loam, 2 to 6 percent slopes, moderately eroded	27	IIe-2	35
TrC2	Trappist silt loam, 6 to 12 percent slopes, moderately eroded	27	IIIe-2	37
TrE	Trappist silt loam, 12 to 25 percent slopes	27	VIe-2	41
TrE2	Trappist silt loam, 12 to 25 percent slopes, moderately eroded	27	VIe-2	41
TsC3	Trappist soils, 6 to 12 percent slopes, severely eroded	27	VIe-1	40
TsE3	Trappist soils, 12 to 25 percent slopes, severely eroded	27	VIIe-2	42
Wa	Wakeland silt loam	28	IIw-2	36
WeB	Wellston silt loam, 2 to 6 percent slopes	28	IIe-2	35
WeC	Wellston silt loam, 6 to 12 percent slopes	28	IIIe-2	37
WeD	Wellston silt loam, 12 to 18 percent slopes	28	IVe-2	39
WeD2	Wellston silt loam, 12 to 18 percent slopes, moderately eroded	29	IVe-2	39
WeE	Wellston silt loam, 18 to 25 percent slopes	29	VIe-2	41
WeE2	Wellston silt loam, 18 to 25 percent slopes, moderately eroded	29	VIe-2	41
WfD3	Wellston soils, 12 to 18 percent slopes, severely eroded	29	VIIe-2	42
WfE3	Wellston soils, 18 to 25 percent slopes, severely eroded	29	VIIe-2	42
Wh	Whitcomb silt loam	29	IIw-1	35
WrA	Wilbur silt loam, 0 to 2 percent slopes	30	IIw-2	36
WtA	Wilbur silt loam, high bottom, 0 to 2 percent slopes	30	IIw-2	36
WtB	Wilbur silt loam, high bottom, 2 to 6 percent slopes	30	IIw-2	36
ZaB2	Zanesville silt loam, 2 to 6 percent slopes, moderately eroded	31	IIe-1	34
ZaC	Zanesville silt loam, 6 to 12 percent slopes	31	IIIe-1	36
ZaC2	Zanesville silt loam, 6 to 12 percent slopes, moderately eroded	31	IIIe-1	36
ZaD	Zanesville silt loam, 12 to 18 percent slopes	31	IVe-2	39
ZaD2	Zanesville silt loam, 12 to 18 percent slopes, moderately eroded	31	IVe-2	39
ZaE	Zanesville silt loam, 18 to 25 percent slopes	31	VIe-2	41
ZsC3	Zanesville soils, 6 to 12 percent slopes, severely eroded	31	IVe-1	38
ZsD3	Zanesville soils, 12 to 18 percent slopes, severely eroded	31	VIe-1	40
ZsE3	Zanesville soils, 18 to 25 percent slopes, severely eroded	31	VIIe 2	42

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Growth Through Agricultural Progress

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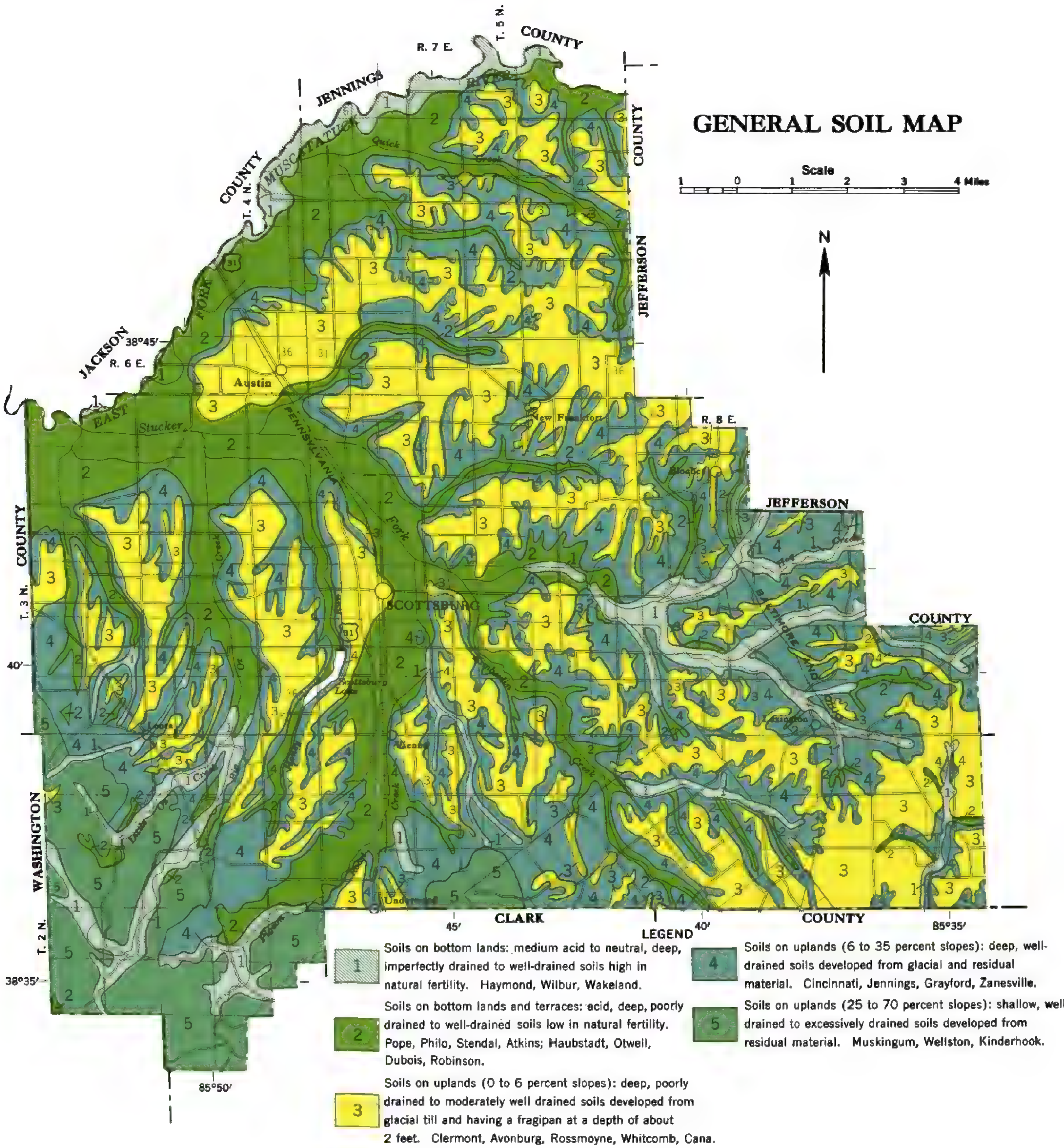
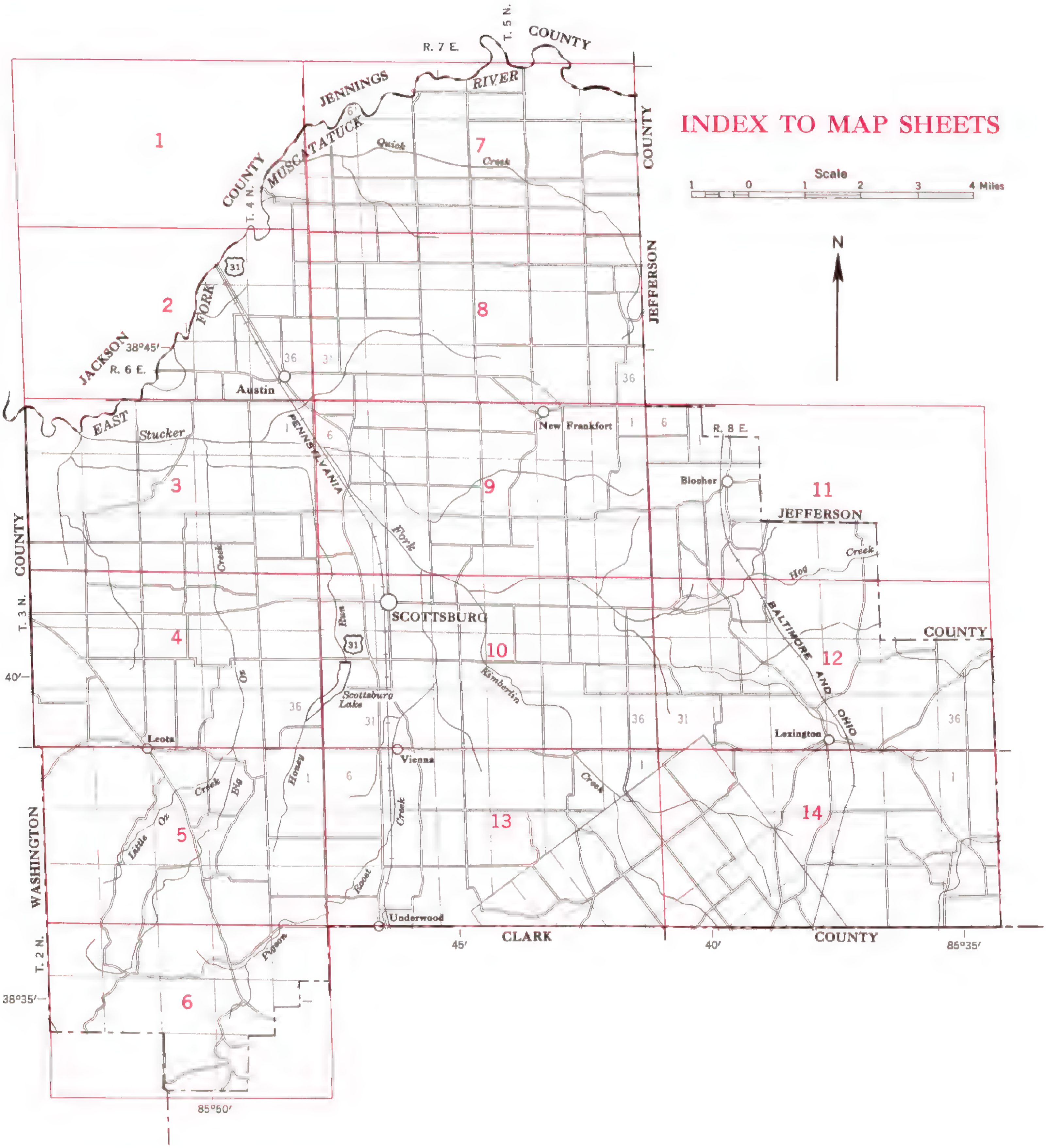

GENERAL SOIL MAP
Scale
1 0 1 2 3 4 Miles
N
JENNINGS COUNTY
JEFFERSON COUNTY
JACKSON COUNTY
WASHINGTON COUNTY
CLARK COUNTY
R. 6 E.
R. 7 E.
R. 8 E.
T. 5 N.
T. 4 N.
T. 3 N.
T. 2 N.
38°45′
40′
38°35′
85°50′
45′
40′
85°35′
MUSCATATUCK RIVER
EAST FORK
Stucker
PENNSYLVANIA
Fork
Quick Creek
Austin
New Frankfort
SCOTTSBURG
Scottsburg Lake
Lexington
BALTIMORE AND OHIO
Underwood
Vienna
Leota
Hog Creek
LEGEND
1 Soils on bottom lands: medium acid to neutral, deep, imperfectly drained to well-drained soils high in natural fertility. Haymond, Wilbur, Wakeland.
2 Soils on bottom lands and terraces: acid, deep, poorly drained to well-drained soils low in natural fertility. Pope, Philo, Stendal, Atkins; Haubstadt, Otwell, Dubois, Robinson.
3 Soils on uplands (0 to 6 percent slopes): deep, poorly drained to moderately well drained soils developed from glacial till and having a fragipan at a depth of about 2 feet. Clermont, Avonburg, Rossmoyne, Whitcomb, Cana.
4 Soils on uplands (6 to 35 percent slopes): deep, well-drained soils developed from glacial and residual material. Cincinnati, Jennings, Grayford, Zanesville.
5 Soils on uplands (25 to 70 percent slopes): shallow, well drained to excessively drained soils developed from residual material. Muskingum, Wellston, Kinderhook.

INDEX TO MAP SHEETS



SOIL LEGEND

The first letter in each soil symbol is the initial of the soil series name. If slope forms part of the soil name, a second capital letter shows the range of steepness. A number shows that the soil is named as eroded.

SYMBOL	NAME
At	Atkins silt loam
AvA	Avonburg silt loam, 0 to 2 percent slopes
AvB	Avonburg silt loam, 2 to 6 percent slopes
AvB2	Avonburg silt loam, 2 to 6 percent slopes, moderately eroded
CaA	Cana silt loam, 0 to 2 percent slopes
CaB	Cana silt loam, 2 to 6 percent slopes
CaB2	Cana silt loam, 2 to 6 percent slopes, moderately eroded
CbB3	Cana soils, 2 to 6 percent slopes, severely eroded
CcB	Cincinnati silt loam, 2 to 6 percent slopes
CcB2	Cincinnati silt loam, 2 to 6 percent slopes, moderately eroded
CcC	Cincinnati silt loam, 6 to 12 percent slopes
CcC2	Cincinnati silt loam, 6 to 12 percent slopes, moderately eroded
CcD	Cincinnati silt loam, 12 to 18 percent slopes
CcD2	Cincinnati silt loam, 12 to 18 percent slopes, moderately eroded
CcE	Cincinnati silt loam, 18 to 25 percent slopes
CcE2	Cincinnati silt loam, 18 to 25 percent slopes, moderately eroded
CcF	Cincinnati silt loam, 25 to 35 percent slopes
CcF2	Cincinnati silt loam, 25 to 35 percent slopes, moderately eroded
CeC3	Cincinnati soils, 6 to 12 percent slopes, severely eroded
CeD3	Cincinnati soils, 12 to 18 percent slopes, severely eroded
CeE3	Cincinnati soils, 18 to 25 percent slopes, severely eroded
Cm	Clermont silt loam
CoE	Colyer soils, 12 to 25 percent slopes
CoF	Colyer soils, 25 to 60 percent slopes
DbA	Dubois silt loam, 0 to 2 percent slopes
DbB	Dubois silt loam, 2 to 6 percent slopes
DbB2	Dubois silt loam, 2 to 6 percent slopes, moderately eroded
GaB	Grayford silt loam, 2 to 6 percent slopes
GaB2	Grayford silt loam, 2 to 6 percent slopes, moderately eroded
GaC2	Grayford silt loam, 6 to 12 percent slopes, moderately eroded
GaD2	Grayford silt loam, 12 to 18 percent slopes, moderately eroded
GaE	Grayford silt loam, 18 to 25 percent slopes
GaE2	Grayford silt loam, 18 to 35 percent slopes, moderately eroded
GaF	Grayford silt loam, 25 to 35 percent slopes
GfC3	Grayford soils, 6 to 12 percent slopes, severely eroded
GfD3	Grayford soils, 12 to 18 percent slopes, severely eroded
Gg	Gullied land, acid shale materials
Gm	Gullied land, neutral shale materials
Gr	Gullied land, glacial materials
HaB	Haubstadt silt loam, 2 to 6 percent slopes
HaB2	Haubstadt silt loam, 2 to 6 percent slopes, moderately eroded
HbB3	Haubstadt soils, 2 to 6 percent slopes, severely eroded
HdA	Haymond silt loam, 0 to 2 percent slopes
HdB	Haymond silt loam, 2 to 6 percent slopes
HhA	Haymond silt loam, high bottom, 0 to 2 percent slopes
HhB	Haymond silt loam, high bottom, 2 to 6 percent slopes
JeC	Jennings silt loam, mixed substratum, 6 to 12 percent slopes
JeC2	Jennings silt loam, mixed substratum, 6 to 12 percent slopes, moderately eroded
JeD	Jennings silt loam, mixed substratum, 12 to 18 percent slopes
JeE	Jennings silt loam, mixed substratum, 18 to 25 percent slopes
JgC3	Jennings soils, mixed substratum, 6 to 12 percent slopes, severely eroded
JgD3	Jennings soils, mixed substratum, 12 to 18 percent slopes, severely eroded
JhB	Jennings silt loam, heavy substratum, 2 to 6 percent slopes
JhB2	Jennings silt loam, heavy substratum, 2 to 6 percent slopes, moderately eroded
JhC	Jennings silt loam, heavy substratum, 6 to 12 percent slopes
JhC2	Jennings silt loam, heavy substratum, 6 to 12 percent slopes, moderately eroded
JhD	Jennings silt loam, heavy substratum, 12 to 18 percent slopes
JhD2	Jennings silt loam, heavy substratum, 12 to 18 percent slopes, moderately eroded
JhE	Jennings silt loam, heavy substratum, 18 to 25 percent slopes
JhF	Jennings silt loam, heavy substratum, 25 to 35 percent slopes
JkC3	Jennings soils, heavy substratum, 6 to 12 percent slopes, severely eroded
JkD3	Jennings soils, heavy substratum, 12 to 18 percent slopes, severely eroded
JkE3	Jennings soils, heavy substratum, 18 to 25 percent slopes, severely eroded
JmB	Jennings silt loam, 2 to 6 percent slopes
JmB2	Jennings silt loam, 2 to 6 percent slopes, moderately eroded
JmC	Jennings silt loam, 6 to 12 percent slopes
JmC2	Jennings silt loam, 6 to 12 percent slopes, moderately eroded
JmD	Jennings silt loam, 12 to 18 percent slopes
JmD2	Jennings silt loam, 12 to 18 percent slopes, moderately eroded
JnB3	Jennings soils, 2 to 6 percent slopes, severely eroded
JnC3	Jennings soils, 6 to 12 percent slopes, severely eroded
JnD3	Jennings soils, 12 to 18 percent slopes, severely eroded
JrE	Jennings and Colyer silt loams, 18 to 25 percent slopes
JrE2	Jennings and Colyer silt loams, 18 to 25 percent slopes, moderately eroded
JsE3	Jennings and Colyer soils, 18 to 25 percent slopes, severely eroded
Ju	Johnsburg silt loam
KhD	Kinderhook silty clay loam, 12 to 18 percent slopes
KhF	Kinderhook silty clay loam, 18 to 35 percent slopes
Ma	Made land
MuF	Muskingum silt loam, 25 to 35 percent slopes
MuG	Muskingum silt loam, 35 to 70 percent slopes
OtB	Otwell silt loam, 2 to 6 percent slopes
OtC2	Otwell silt loam, 6 to 12 percent slopes, moderately eroded
OtD	Otwell silt loam, 12 to 18 percent slopes
OtE	Otwell silt loam, 18 to 25 percent slopes
OwC3	Otwell soils, 6 to 12 percent slopes, severely eroded
OwD3	Otwell soils, 12 to 18 percent slopes, severely eroded
OwE3	Otwell soils, 18 to 25 percent slopes, severely eroded
PaB2	Parke silt loam, 2 to 6 percent slopes, moderately eroded
PaC2	Parke silt loam, 6 to 12 percent slopes, moderately eroded
PaD	Parke silt loam, 12 to 18 percent slopes
PaE	Parke silt loam, 18 to 25 percent slopes
PeC3	Parke soils, 6 to 12 percent slopes, severely eroded
PeD3	Parke soils, 12 to 18 percent slopes, severely eroded
PhA	Philo silt loam, 0 to 2 percent slopes
PhB	Philo silt loam, 2 to 6 percent slopes
Po	Pope silt loam
Rb	Robinson silt loam
RmA	Rossmoyne silt loam, 0 to 2 percent slopes
RmB	Rossmoyne silt loam, 2 to 6 percent slopes
RmB2	Rossmoyne silt loam, 2 to 6 percent slopes, moderately eroded
RmC2	Rossmoyne silt loam, 6 to 12 percent slopes, moderately eroded
RoB3	Rossmoyne soils, 2 to 6 percent slopes, severely eroded
RoC3	Rossmoyne soils, 6 to 12 percent slopes, severely eroded
St	Stendal silt loam
TmA	Tilsit silt loam, 0 to 2 percent slopes
TmB	Tilsit silt loam, 2 to 6 percent slopes
TmB2	Tilsit silt loam, 2 to 6 percent slopes, moderately eroded
TnB	Tilsit silt loam, moderately well drained, 2 to 6 percent slopes
TnB2	Trappist silt loam, moderately well drained, 2 to 6 percent slopes, moderately eroded
TrB	Trappist silt loam, 2 to 6 percent slopes
TrC	Trappist silt loam, 6 to 12 percent slopes
TrB2	Trappist silt loam, 2 to 6 percent slopes, moderately eroded
TrC2	Trappist silt loam, 6 to 12 percent slopes, moderately eroded
TrE	Trappist silt loam, 12 to 25 percent slopes
TrE2	Trappist silt loam, 12 to 25 percent slopes, moderately eroded
TsC3	Trappist soils, 6 to 12 percent slopes, severely eroded
TsE3	Trappist soils, 12 to 25 percent slopes, severely eroded
Wa	Wakeland silt loam
WeB	Wellston silt loam, 2 to 6 percent slopes
WeC	Wellston silt loam, 6 to 12 percent slopes
WeD	Wellston silt loam, 12 to 18 percent slopes
WeD2	Wellston silt loam, 12 to 18 percent slopes, moderately eroded
WeE	Wellston silt loam, 18 to 25 percent slopes
WeE2	Wellston silt loam, 18 to 25 percent slopes, moderately eroded
WfD3	Wellston soils, 12 to 18 percent slopes, severely eroded
WfE3	Wellston soils, 18 to 25 percent slopes, severely eroded
Wh	Whitcomb silt loam
WrA	Wilbur silt loam, 0 to 2 percent slopes
WtA	Wilbur silt loam, high bottom, 0 to 2 percent slopes
WtB	Wilbur silt loam, high bottom, 2 to 6 percent slopes
ZaB2	Zanesville silt loam, 2 to 6 percent slopes, moderately eroded
ZaC	Zanesville silt loam, 6 to 12 percent slopes
ZaC2	Zanesville silt loam, 6 to 12 percent slopes, moderately eroded
ZaD	Zanesville silt loam, 12 to 18 percent slopes
ZaD2	Zanesville silt loam, 12 to 18 percent slopes, moderately eroded
ZaE	Zanesville silt loam, 18 to 25 percent slopes
ZsC3	Zanesville soils, 6 to 12 percent slopes, severely eroded
ZsD3	Zanesville soils, 12 to 18 percent slopes, severely eroded
ZsE3	Zanesville soils, 18 to 25 percent slopes, severely eroded

Soil map constructed 1959 by Cartographic Division, Soil Conservation Service, USDA, from 1955 aerial photographs. Controlled mosaic based on Indiana plane coordinate system, east zone, transverse Mercator projection, 1927 North American datum.

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings

School

Church

Station

Mines and Quarries

Mine dump

Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Oil wells

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant
- Township, civil

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.

Canals and ditches — CANAL, DITCH

Lakes and ponds
- Perennial
- Intermittent

Wells — flowing

Springs

Marsh

Wet spot

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

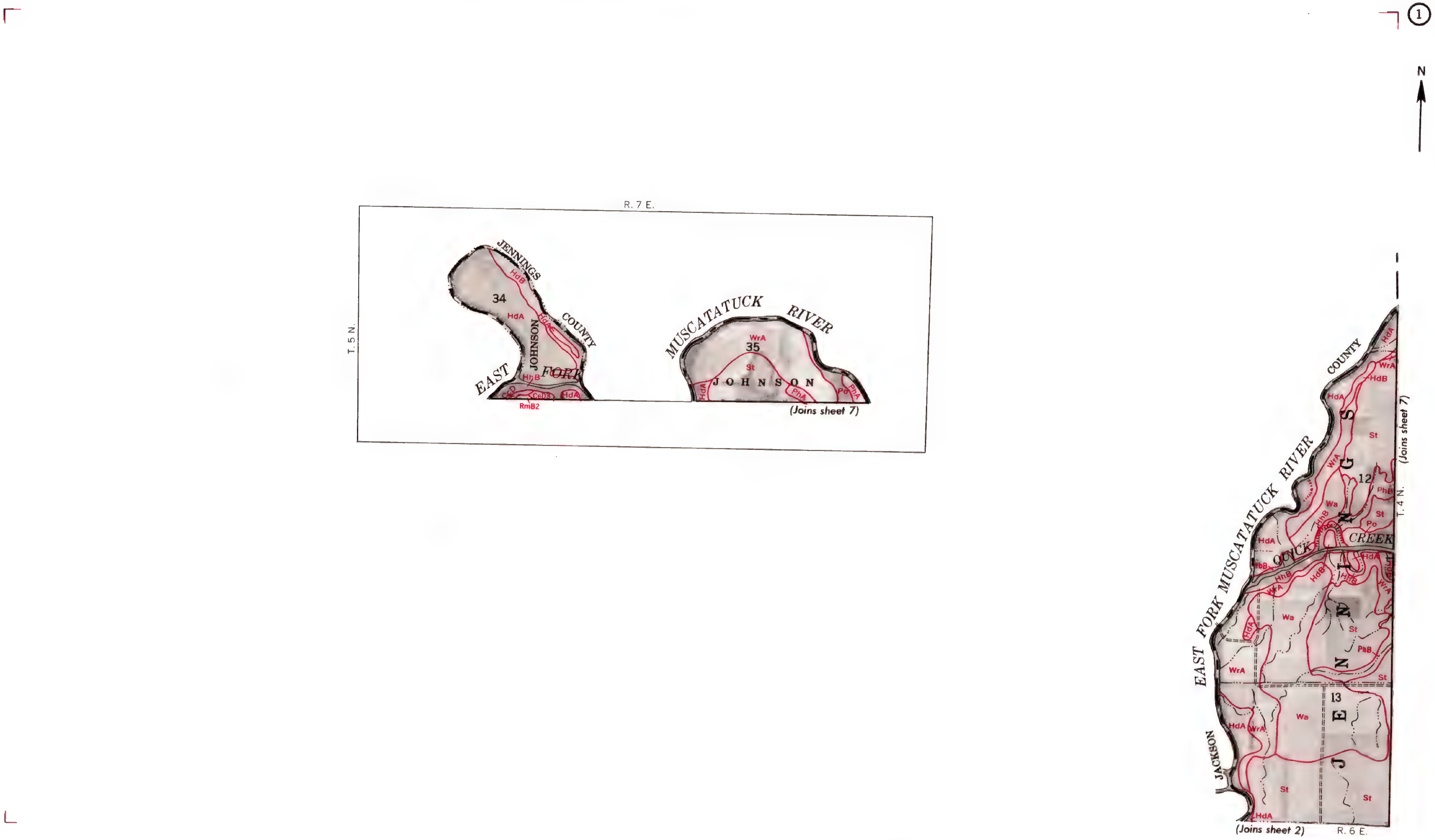
Depressions — Large, Small
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol — Dx
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

Range, township, and section corners shown on this map are indefinite.



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0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

SCOTT COUNTY, INDIANA–SHEET NUMBER 3

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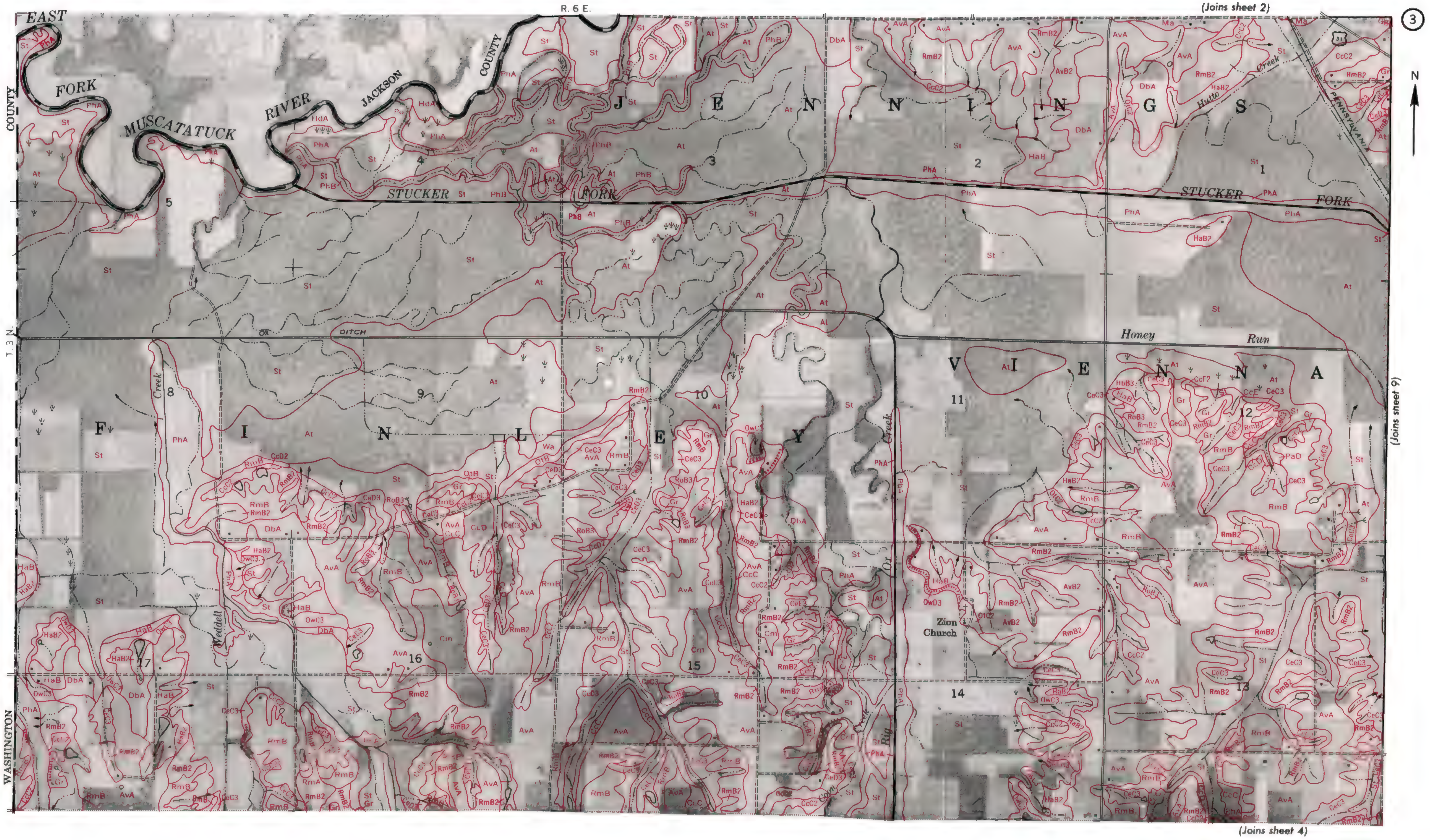

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4

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0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

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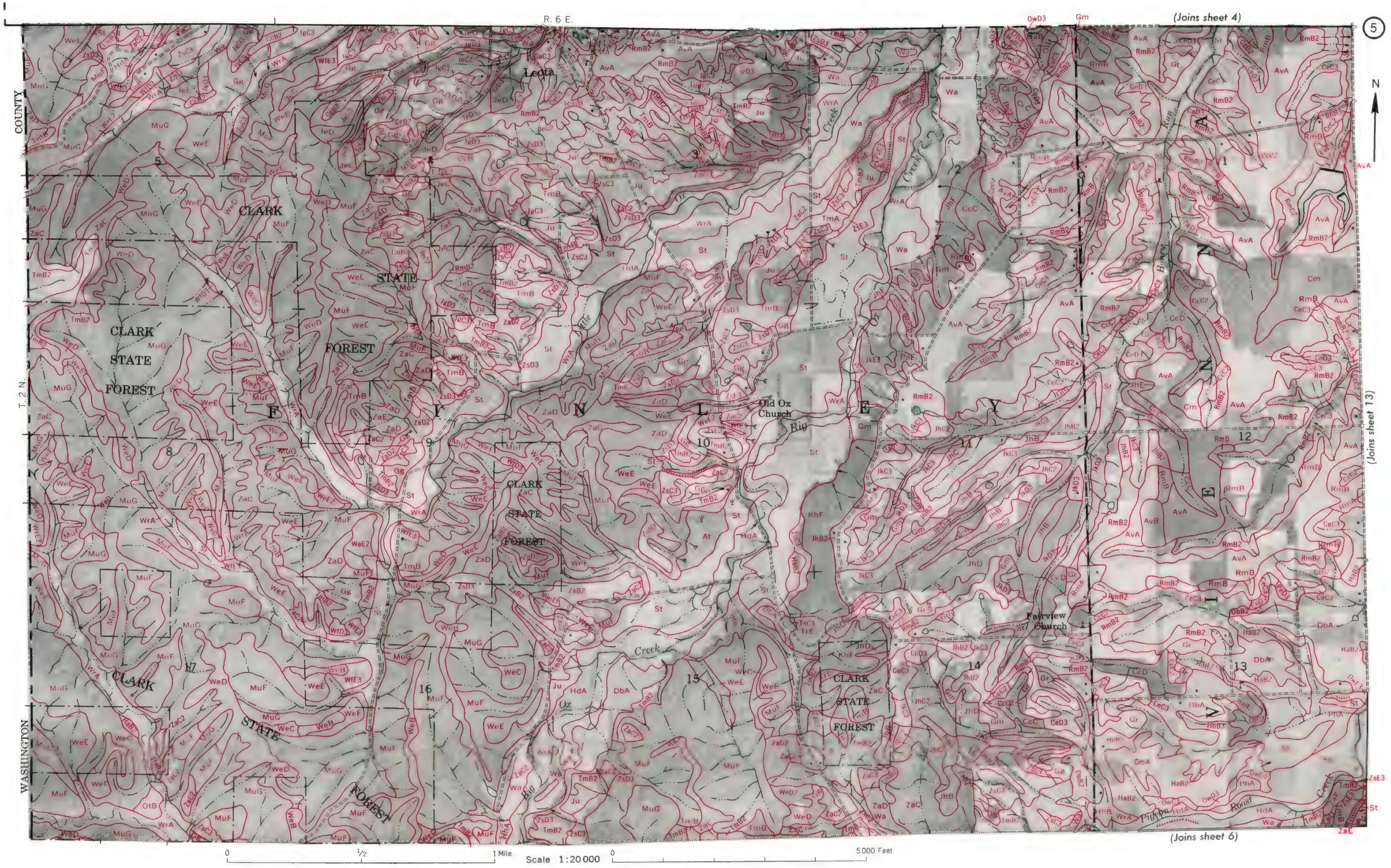
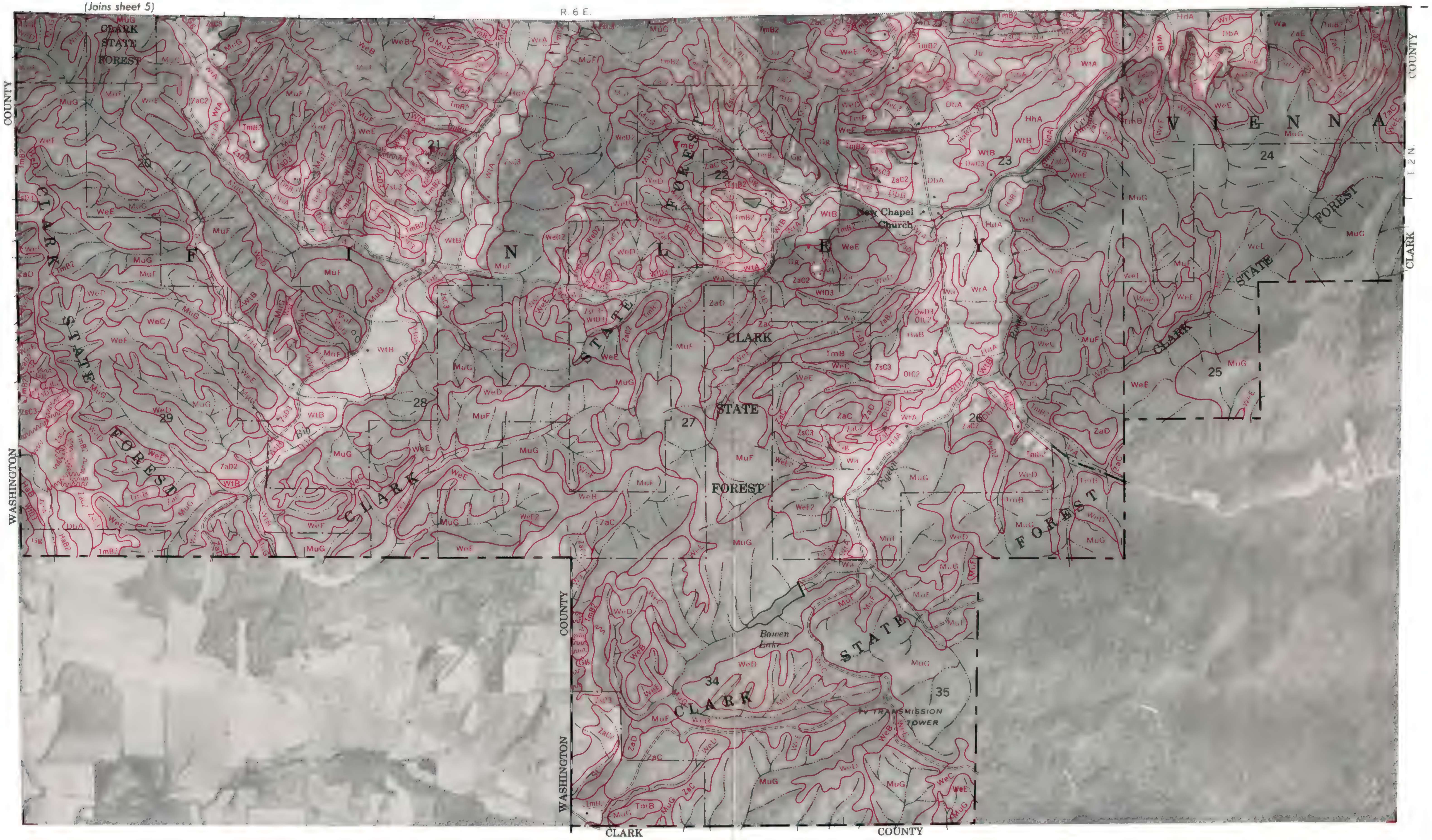


6

N

(Joins sheet 5)



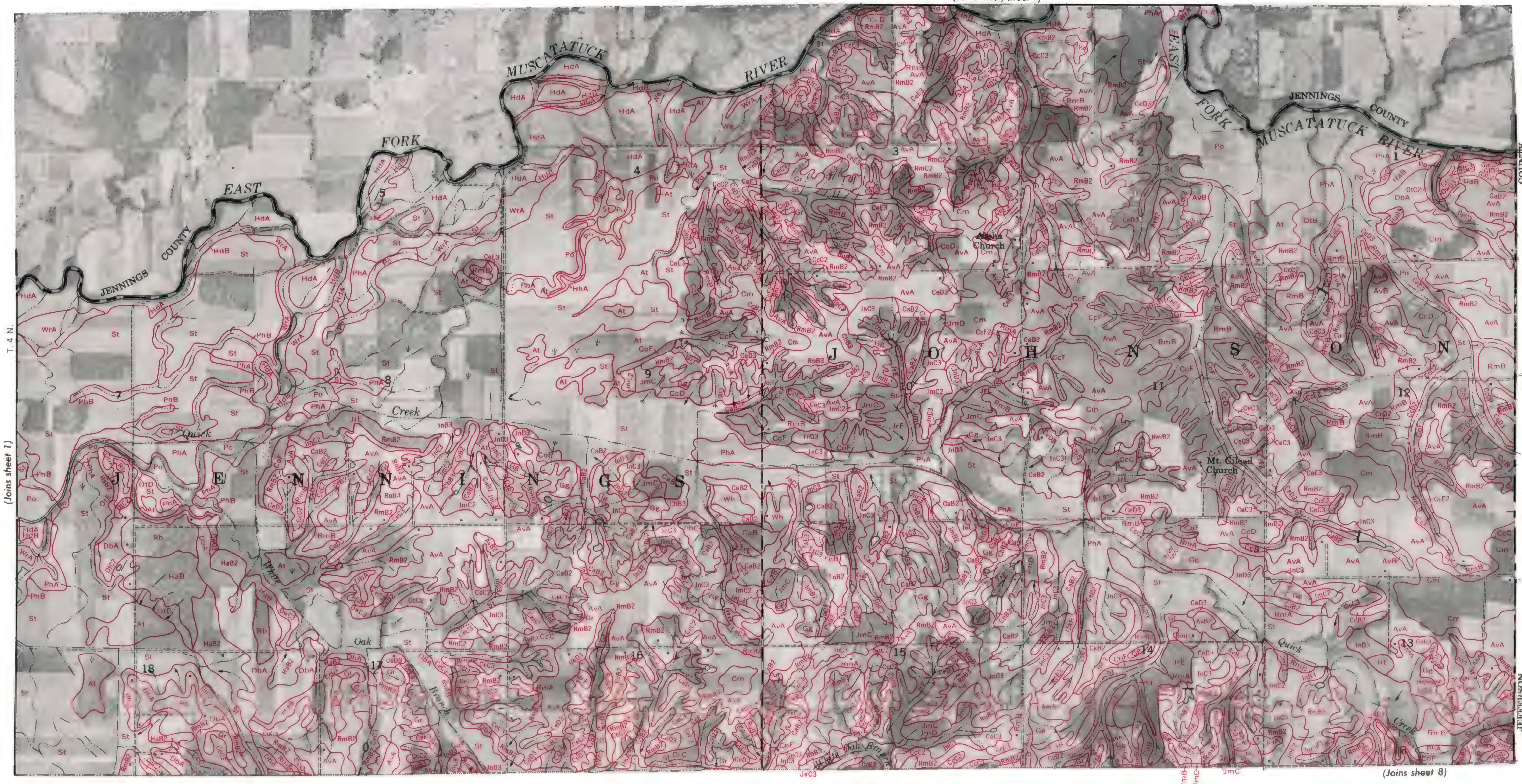
0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

R. 7 E.

(Joins inset, sheet 1)

T. 4 N.

(Joins sheet 1)



(Joins sheet 8)

Scale 1:20000

0 ½ 1 Mile

0 5000 Feet

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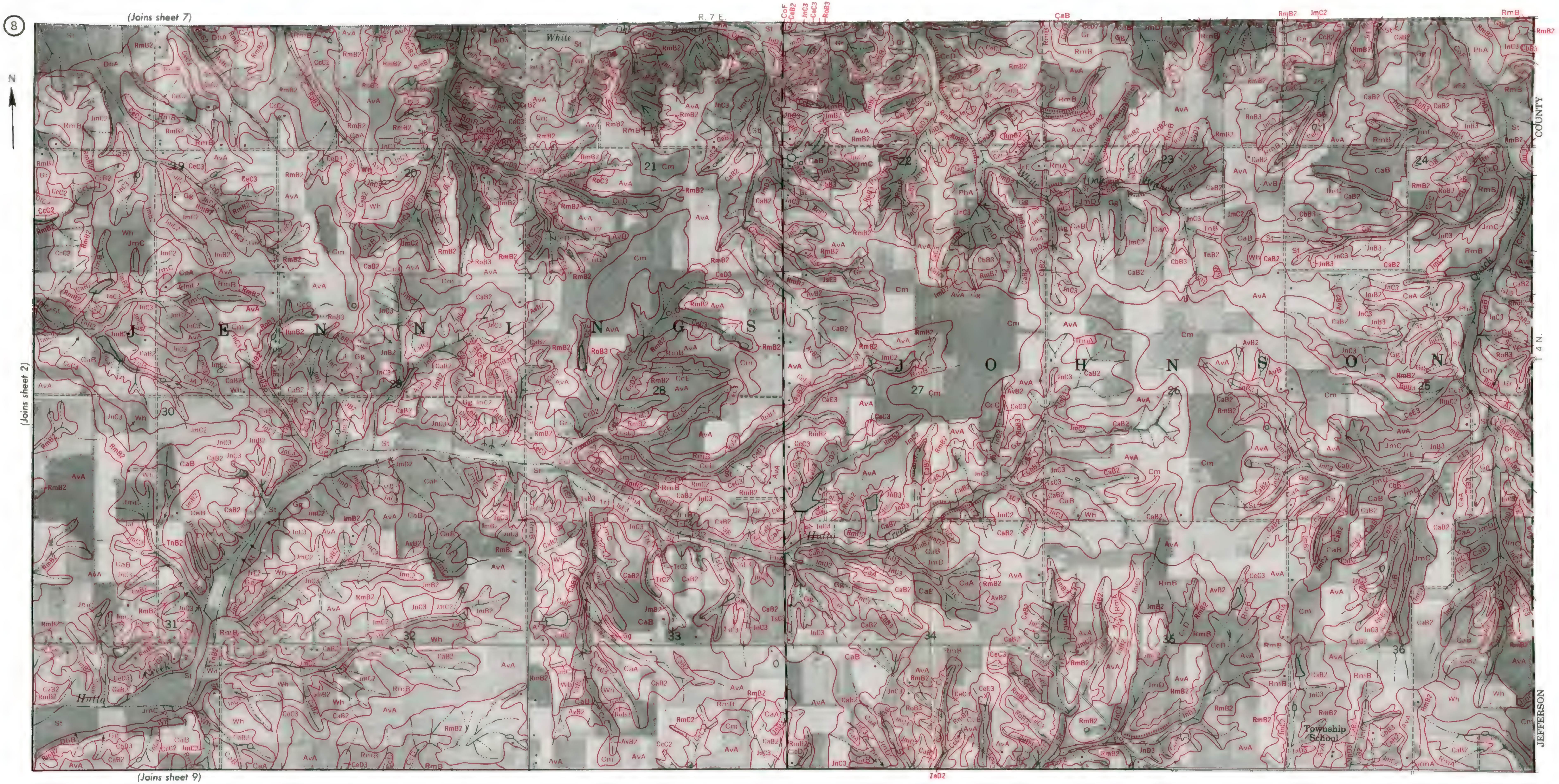

0 1/2 1 Mile Scale 1:20000 0 5000 Feet

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Range, township, and section corners shown on this map are indefinite.

SCOTT COUNTY, INDIANA-SHEET NUMBER 10

Scale 1:20000

11

N

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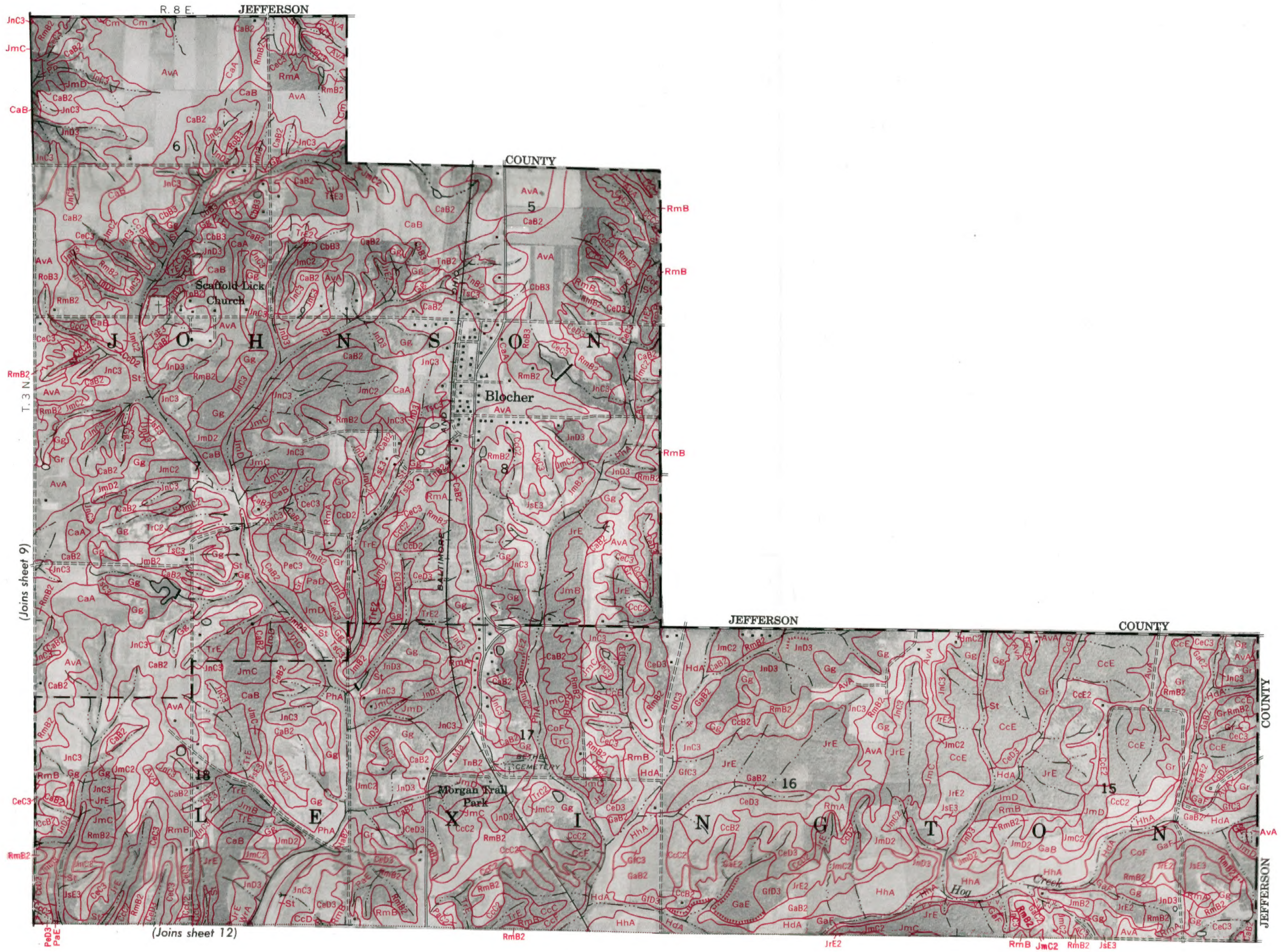

0 ½ 1 Mile
Scale 1:20 000
0 5000 Feet

SCOTT COUNTY, INDIANA-SHEET NUMBER 12

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

SCOTT COUNTY, INDIANA-SHEET NUMBER 13

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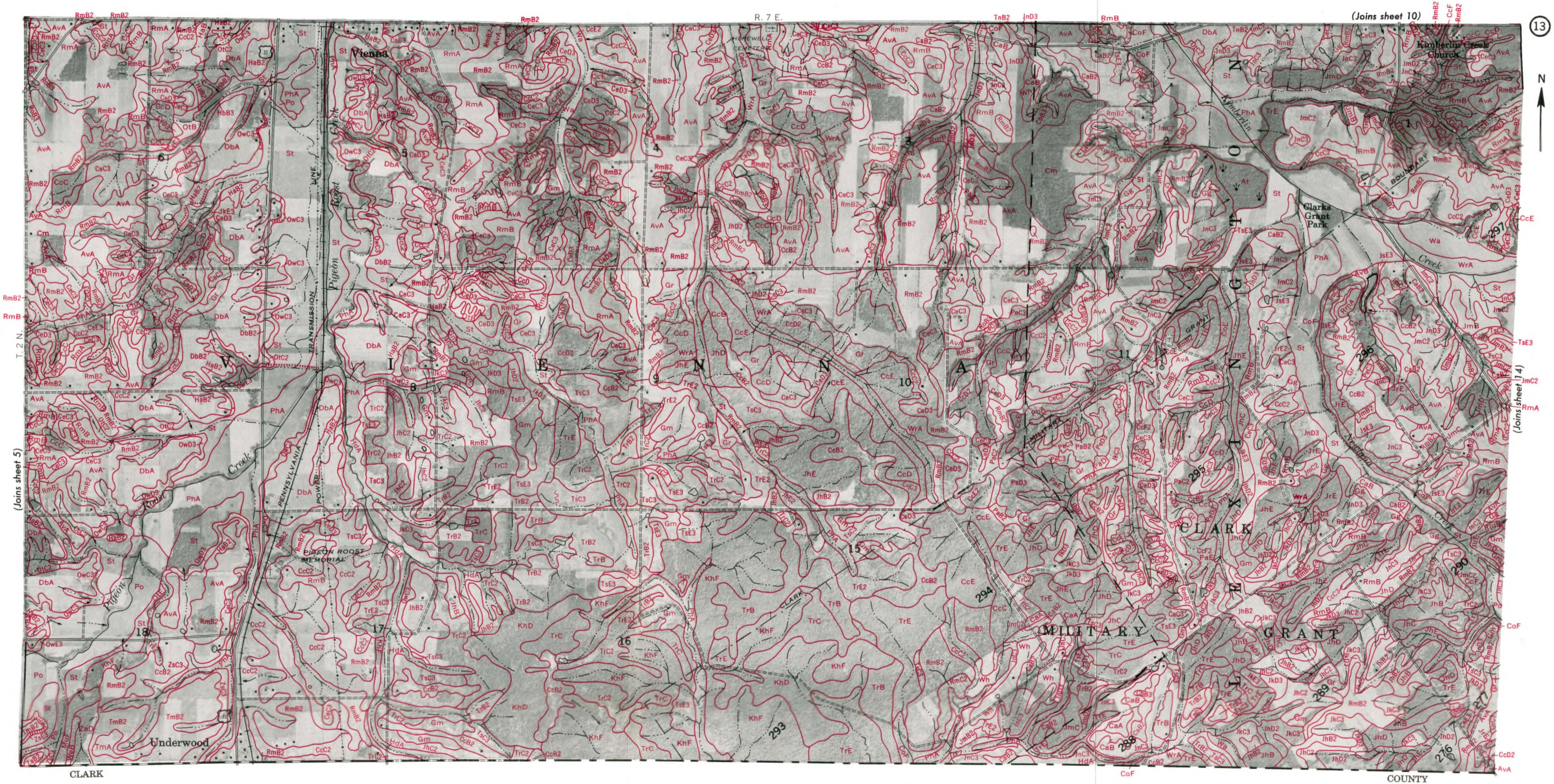
Range, township, and section corners shown on this map are indefinite.



Scale 1:20 000

0 ½ 1 Mile

0 5000 Feet

SCOTT COUNTY, INDIANA-SHEET NUMBER 14